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FOR COMMERCIAL REAL ESTATE 2.0

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The commercial real estate sector including office blocks, retail centres, warehouses, and hotels is facing raising regulatory requirements, increasing expectations from investors and changing social awareness. A specific category of buildings exists that not only has to fulfil high requirements regarding their usage, their usage, safety, accessibility and energy efficiency but they also have to adapt to the new reality of work and the lifestyle of their users. Maybe most importantly, they also have to work for their investors.

Even though the topic of ESG is widely discussed and is becoming better understood, numerous questions and challenges still arise. Businesses that manage real estate, developers, and investors often ask themselves how they can plan and implement an ESG strategy. How can the rising demands of the environment and economics be reconciled? What specific steps can be taken to make the transformation effective, profitable, and long-term?

A crucial part of an effective ESG transformation is a thorough understanding of the goals and a consistent plan of action. It is not enough to just apply the latest regulations – a conscious approach is required to allow the most important fields of change to be identified and to lay out the process of implementing change in carefully-considered steps. Experts and authors, and not just those in this publication, stress that a clear strategy adapted to the specific nature of a business and its property portfolio will result in effective risk management and growth of long-term value.

One of the biggest challenges for the entire commercial real estate sector remains the topic of financing the transformation. Investing in the modernisation of buildings, applying technology to save energy, and creating more sustainable spaces requires significant financial commitments. New models of financing are appearing such as green bonds, ESCO, ESG credit, and public support mechanisms that can facilitate ecologically-friendly initiatives. Regardless of the particular solutions, this strategic challenge is sure to remain of interest throughout the entire sector.

This publication has been prepared by the Polish Council of Shopping Centres (PRCH), the Polish Chamber of Commercial Real Estate (PINK), and the Royal Institution of Chartered Surveyors (RICS) and is intended not only to lay out ESG knowledge for the commercial real estate sector but also to give best practices and recommendations to businesses. We wish to thank all our partners and experts who shared their knowledge and experience resulting in the publication of this work. We believe that it will prove a valuable guide for companies facing the challenges of sustainable development and attempting to build a future where commercial real estate plays a key role in the green transformation of the economy.

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What's new in ESG regulations?

ESG (Environmental, Social, and Corporate Governance) is increasingly gaining importance in the real estate sector, affecting various stages of the property lifecycle: from investment planning, through construction, commercialisation, to property management, regardless of whether it concerns institutional investors, funds, asset managers, property owners, or developers.

Legal regulations related to ESG issues act as a catalyst for transformation: regulations are becoming increasingly complex, forcing market participants to continuously adapt to new realities. The introduction of new regulations concerning, among others, the energy efficiency of buildings, climate neutrality goals (Net Zero), or waste management, compels market participants to adapt to new standards.

The growing number of EU regulations shapes and will continue to shape national law. New legal regulations introduce a range of challenges for market participants, who must adjust their activities to meet new requirements, which calls for appropriate resources and competencies, and often involves the need to invest in new technologies and employee training. Additionally, entrepreneurs must be prepared for more detailed and rigorous controls by supervisory authorities.

Last year's edition of the report included an introduction to EU legal regulations in the field of ESG, summarising the key assumptions of the "Green Deal".

The past year has brought significant changes in this regard. However, which of the new regulations are important from the perspective of an entrepreneur operating in the real estate sector in Poland?

Energy Performance of Buildings Directive (EPBD)

One of more significant changes in 2024 in ESG regulations from the perspective of the real estate market is the adoption by the European Parliament and the Council of the European Union of new content of the Energy Performance of Buildings Directive (EPBD) on 24 April 2024, which is a continuation of earlier regulations on the energy performance of buildings

gradually introduced from 2002 at the EU level and implemented at a national level.

The Directive fits into the broader framework of EU policy, such as the European Green Deal and the "Renovation Wave" strategy.

The EPBD is a key element of European energy and climate policy and is a fundamental tool in the fight to reduce greenhouse gas emissions to achieve climate neutrality by 2050. The Directive aims to improve the energy performance of buildings in the European Union, given that buildings account for 40% of final energy consumption in the European Union and 36% of EU greenhouse gas emissions, making them a key area of action for decarbonisation.

The new EPBD contains a number of provisions, the common basic goals of which are to rationalise energy consumption in existing buildings and to construct new buildings with appropriate energy standards.

The Directive came into force on 29 May, 2024, and EU member states must transpose it into national legal systems by 29 May, 2026.

The EPBD emphasises the importance of financial and technical support from EU member states, which should encourage national financial institutions to promote targeted financial products, grants, and subsidies to improve the energy performance of buildings.

THE MAIN ASSUMPTIONS OF THE NEW EPBD ARE AS FOLLOWS:

01

All new buildings should be net--zero (according to the Directive, a net zero building is a building with a very high energy performance, requiring zero or a very low amount of energy, producing zero on-site carbon emissions from fossil fuels and producing zero or a very low amount of operational greenhouse gas emissions). This obligation will apply to the public sector from 1 January, 2028, and to other buildings from 1 January, 2030. All other existing buildings should achieve net zero status by 2050.

02

Minimum energy performance standards (MEES), which aim to gradually phase out buildings with the worst energy performance. It is assumed that buildings are to be regularly reviewed and updated in light of technological progress: currently, by 2030, 16% of the worst-performing non-residential buildings must be renovated, and by 2033, this percentage increases to 26%.

03

EU member states have committed to reduce average primary energy consumption by at least 16% by 2030 compared to 2020, and by at least 20-22% by 2035 compared to 2020.

It seems that the EPBD is an ambitious step towards decarbonising the building sector in the European Union. Depending on the way in which the provisions of the Directive are transposed into Polish law, the effects may be more or less perceptible for market participants. Following the example of other large European countries, the Polish legislator may decide to increase the severity of regulations by, for example, requiring a specific energy class in the case of sale or lease.

Achieving the goals requires cooperation at EU, national, and local level and the involvement of various stakeholders, including building owners, developers, financial nstitutions, and local communities.

Thanks to its comprehensive approach, the EPBD has the potential to make a significant contribution towards achieving the European Union's climate goals.

Corporate Sustainability Reporting Directive (CSRD)

In Poland, as in other EU member states, EU directives are gradually being implemented into national law (leaving EU member states some degree of discretion), aimed at promoting sustainable development.

One of the most significant recent ESG-related changes in the Polish legal system is the implementation of the CSRD into Polish law through the Act dated 6 December, 2024 amending the Accounting Act,

04

Introduction of so-called "building renovation passports", i.e. tailored action plans for comprehensive renovation of a given building, carried out in the maximum number of stages, which should significantly improve its energy performance. Renovation passports are intended to facilitate access to financial and technical support, which is crucial for the implementation of complex energy renovations.

05

New rules for the preparation of energy performance certificates for buildings (introduction of building classes in terms of energy demand from A to G, where class A means zero-emission buildings).

06

Each member state is required to develop a national building renovation plan. These plans must include an overview of buildings, targets, and progress indicators, and an overview of policies and measures supporting the achievement of these targets.

the Act on Statutory Auditors, Audit Firms, and Public Supervision, and certain other acts, which was signed by the President on 12 December, 2024.

The CSRD gradually replaces the Non-Financial Reporting Directive (NFRD). The main amendments introduced by the CSRD compared to the NFRD include the expansion of the group of entities obliged to disclose non-financial information compared to the scope of entities under the NFRD, as well as the expansion of the scope of reported information, shifting away from the previous optionality, requiring mandatory sustainability reporting standards and mandatory verification of reported information by the auditors.

The new regulations aim to increase transparency and comparability of data, which will help investors and other stakeholders make more informed decisions.

Reporting obligations under the CSRD in the field of sustainable development are gradually imposed on individual entities based on their size, turnover level, and average number of employees.

What does this mean for entities operating in the Polish market? Entities obliged under the CSRD will have to prepare an annual sustainability report. The obligation to report on ESG matters will be treated similarly to financial reporting and failure to comply with legal obligations will result in appropriate consequences (including financial penalties or reputational losses).

According to the CSRD, the first reports under the CSRD will be prepared for the financial year starting 1 January, 2024, by the entities required to report under the NFRD. However, for other entities covered by the CSRD, the initial date for applying the CSRD sustainability reporting requirements varies depending on the type of entrepreneur, with, among others, large entities required to report in 2026 for 2025, SMEs listed on regulated markets required to report in 2027 for 2026, and subsidiaries whose parent companies are based outside the EU required to report in 2029 for 2028.

What about Polish entrepreneurs who are not directly obliged under the CSRD? Such entities, despite not being directly obliged to report, may be required to collect data on their impact on sustainability issues by their business partners or companies within the same capital group that are obliged to report under the CSRD (the so-called “cascade effect”).

European Sustainability Reporting Standards (ESRS)

As mentioned above, the CSRD imposed the obligation to establish uniform reporting standards, although the CSRD itself does not regulate the exact content and structure of the reports to be published by the obliged entities.

Since the foundation of ESG is the collection of appropriate data and the ability to organise it in a structured manner through reporting, the introduction of reporting standards, which makes data more comparable, became necessary.

In response to this need, the European Sustainability Reporting Standards (ESRS) were developed by the European Financial Reporting Advisory Group (EFRAG) and were adopted in the form of a regulation published in December, 2023, which, unlike a directive, does not require implementation in member states due to its direct application.

In connection with the introduction of the CSRD into Polish law, the entities required under the CSRD should report in accordance with the ESRS, as explicitly indicated in the Act dated 6 December 2024, amending the Accounting Act, the Act on Statutory Auditors, Audit Firms, and Public Supervision, and certain other acts.

The ESRS specify detailed guidelines on what information should be disclosed and how it should be disclosed by entities obliged under the CSRD to ensure greater transparency and comparability of sustainability reporting.

Soon, the first reports of entities obliged under the CSRD for 2024 will be published (i.e., those entities that were also obliged to report under the NFRD), which, for the first time, are to be prepared in accordance with the ESRS. However, the ESRS can also be used by other entities that are not yet legally obliged to report for 2024, but still face increased demand for collecting sustainability data due to the so-called “cascade effect”, as mentioned above.

Nevertheless, it has been raised by the market participants that for many entities, especially those with no experience in ESG reporting, the ESRS may initially seem complicated and difficult to implement, requiring the support of experts.

Under the CSRD, the first reports will be prepared for the financial year that started on 1 January, 2024 by entities required to report under the NFRD

EFRAG is tasked with providing practical support for reporting entities in implementing the ESRS. Among other things, EFRAG has published a set of technical explanations to help stakeholders apply the ESRS. The explanations are regularly updated, allowing entities obliged to report under the CSRD, as well as other entities, to obtain interpretative guidance. EFRAG has also launched an online platform, the "ESRS Q&A Platform" to collect and respond to technical questions and support those preparing non-financial reports, as well as other stakeholders, in implementing the ESRS. The provided responses, however, are not binding interpretations, but rather non-binding guidelines. Additionally, in response to numerous questions submitted through the "ESRS Q&A Platform" in June 2024, EFRAG published three implementation guidance documents on the application of the ESRS. These are intended to assist obliged entities in applying the ESRS.

Summary

Looking ahead, we can expect that sustainable development will play an increasingly important role in the market at both EU and national levels.

In the face of constant regulatory changes, it is crucial for market participants to keep track of new legal requirements, including reporting requirements, and to be able to flexibly adapt their business activities dynamically changing conditions. Education and awareness of entrepreneurs will be the key to achieving the sustainable development goals.

Changing regulations pose new challenges for entrepreneurs, but will also create new opportunities. Therefore, it is worth keeping up with the latest regulations and actively implementing sustainable development principles to maintain a competitive edge and meet the requirements of the future. ◢

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The real estate market in the face of transparency

The modern commercial real estate market is undergoing a significant transformation, driven by growing environmental awareness and increasingly stringent regulatory requirements for sustainability. Investors, developers, and property managers are increasingly tasked with integrating ESG (Environmental, Social, Governance) strategies into their operations. A key area gaining prominence in this context is energy optimisation and decarbonisation.

Long-term Power Purchase Agreements (PPAs) for renewable energy play a foundational role in achieving these goals. They enable property owners to reach carbon neutrality while enhancing operational cost predictability. However, the importance of PPAs extends beyond financial benefits — they are also a testament to a company's commitment to sustainability, which is becoming an essential factor in decisions made by tenants and investors alike.

It is critical to distinguish between PPAs and unbundled Guarantees of Origin (GO). While both tools support environmental claims, their impact on actual greenhouse gas emission reductions and the development of new renewable energy projects differs significantly. PPAs, unlike GO, are directly linked to the production of green energy, driving the creation of new renewable energy projects. Unbundled Guarantees of Origin, although valuable for ESG reporting, are merely certificates purchased on the secondary market, often without influencing the expansion of renewable energy sources.

Clear communication in this area is essential for building transparency and credibility with stakeholders. Companies in the commercial real estate sector that choose PPAs demonstrate their long-term commitment to meaningful decarbonisation and supporting the energy transition. At a time when sustainability is becoming the norm rather than an option, conscious decisions regarding energy sources and their communication to partners and clients are becoming a strategic differentiator in a competitive market.

In the Renewable Energy Sector (RES), long-term energy sales agreements, such as Power Purchase Agreements (PPA), are the cornerstone of project profitability. These agreements not only stabilise energy producers' revenues but also support the implementation of ESG strategies, enabling companies

to harmonise environmental, social, and financial benefits. With the increasing number of projects and technological advancements, refinancing has become a crucial financial mechanism that supports the development and maintenance of RES projects.

The Role of Refinancing in RES Projects

Refinancing allows for re-obtaining capital or securing better financing terms, contributing to the project's financial stability. This mechanism is particularly significant in debt-financed projects, such as PV and wind farms, where initial capital costs are high. For PPAs, refinancing can therefore be a key element in cost management, further promoting ESG goals.

1. Reduction of Capital Costs: Once a project reaches the operational phase and revenues stabilize through long-term agreements, refinancing enables more favorable credit terms. By lowering debt costs, the project becomes more profitable, and profits can be reinvested in further RES development.
2. Facilitating Capital for New Projects: Investors often use refinancing to free up capital from current projects and allocate it to new RES investments. Profits generated through refinancing can be reinvested into the development of additional solar or wind farms, supporting further environmental goals.
3. Financial Stability and ESG Reporting: Refinancing enhances financial stability. Lower capital costs and increased predictability of cash flows are well-received by investors, especially those seeking stable and sustainable investments. In the context of ESG strategies, the ability to refinance projects serves as proof of their economic sustainability and financial resilience, which is an important factor in assessing projects from a corporate governance perspective.
4. Reducing Project Risks: Refinancing reduces financial risks associated with RES projects. The financial stability provided by long-term PPAs enables better refinancing terms while protecting investors' interests, which can be critical in evaluating projects by financial institutions.

The Importance of Financial Stability and Refinancing

Refinancing projects covered by long-term PPAs allows for greater financial stability and cost optimisation. It enables project owners to further invest in emission-reducing technologies, such as energy storage systems, which enhance efficiency and profitability.

Refinancing is particularly important when a project has an established operational history and stable revenues from long-term PPAs. This allows for renegotiating financing terms, which, in practice, means lower debt burdens and more funds available for project development.

Refinancing applies to both greenfield and brownfield projects:

- Greenfield – These are new projects where refinancing becomes useful after the construction phase and the project's transition to the operational phase. Once stable revenues are achieved through long-term PPAs, owners can seek refi-

POWER PURCHASE AGREEMENT – PPA

Long-term renewable power purchase agreements enable property owners to achieve climate neutrality while making operating costs more predictable.

nancing to obtain better credit terms, reducing capital costs and increasing project profitability.
- Brownfield – Projects that are already operational, with an established track record and stable cash flows. In this case, refinancing aims to reduce debt costs and obtain additional funds for modernisation or expansion, e.g., incorporating energy storage technologies or repowering.

For greenfield farms, refinancing typically becomes viable after entering the operational phase, while for brownfield projects, it is more commonly used as a tool for cost optimization and reinvestment.

Spot Market vs. PPA Contracts

Selling energy on the spot market, where prices are dynamic, is possible but comes with significant risk in practice. Spot market prices can fluctuate drastically, which reduces revenue for producers. In the long term, this level of risk is unacceptable for both project owners and investors, especially those focusing on sustainable investments and achieving ESG goals.

PPA contracts offer revenue predictability. Stable financing through PPAs also facilitates investment in additional technologies that can enhance the stability of the energy system and further reduce emissions.

The pricing of energy in a PPA contract differs depending on whether it is conducted by the producer (e.g., owner of a PV or wind farm) or an energy trading company (trader). Here is how each party approaches energy valuation:

Energy Producer (e.g., photovoltaic or wind farm)

The owner of a renewable energy installation primarily considers project stability, profitability, and covering operational costs and profit when pricing energy. Key factors influencing the valuation include:

- **Capital Costs:** The producer accounts for investment costs (CAPEX), such as construction and commissioning of the installation, financing costs, and expected maintenance and operational costs (OPEX).
- **Return on Investment:** The producer considers the expected internal rate of return (IRR) for investors. The energy price in a PPA must be high enough to achieve the target return while compensating for the risks associated with the project.
- **PPA Contract Duration:** The longer the contract, the greater the stability of cash flows. Producers may price energy at a lower level in exchange for long-term revenue security.
- **Operational Costs:** The producer takes into account operational expenses, such as maintenance, servicing, taxes, and potential costs related to technology updates.

Trading Company / Balancingity

A company that purchases energy from the producer and resells it (often to various buyers or on the wholesale market) values energy based on different criteria:

- **Market Price:** The trading company references current and projected energy prices on the spot

market or in forward contracts. It seeks to buy energy below the market price to achieve a margin upon resale.

- **Price Forecasts:** Traders heavily rely on electricity price forecasts, which are based on supply, demand, fuel prices, and weather forecasts. These tools help assess potential price changes and price risk.
- **Energy Profile Cost:** Renewable energy, particularly wind and solar, is generated intermittently. The trading company considers the risk associated with the energy delivery profile (i.e., irregular supply) and may account for additional hedging costs, which can lower their valuation.
- **Trading Margin:** The trading company's goal is to achieve a margin, so traders determine the purchase price of energy by factoring in their operational costs and target profit.

Differences in Approach

- Producers aim for revenue stability to minimise financial risk and ensure a predictable return on investment.
- Trading Companies, on the other hand, value energy based on market liquidity and trading profitability, factoring in price risks and the potential to secure a margin.

This difference often leads to tension: many producers do not accept very low PV profile valuations from trading companies, while traders do not understand why their offers are rejected. The reason is simple: producers seek the bankability of the agreement, which means minimising any risk to revenue streams.

PPA – A Tool for Sustainable Development

A PPA is a long-term contract that enables project owners to forecast revenues without the risk associated with price fluctuations. Additionally, PPAs allow companies to purchase renewable energy, supporting their commitments to reducing carbon emissions.

1. Energy Purchase Price: A stable purchase price allows corporations to better control their energy costs, which is particularly important for companies committed to emissions reductions as part of ESG goals.
2. Environmental Attributes: PPAs also include environmental attributes, such as Guarantees of Origin sourced from the same installation. These serve as evidence that the energy comes from renewable sources, specifically from a particular installation. For buyers, the PPA is a technical proof of this relationship, and the guarantee confirms it.

Thanks to PPAs, buyers can meet their carbon emission commitments, while energy producers can develop green projects with confidence that their investments will be profitable in the long run. For companies focusing on ESG, PPAs are becoming one of the most critical instruments for achieving carbon neutrality.

Virtual PPAs (vPPAs)

On the Polish market, virtual PPAs (vPPAs) have become popular instruments for many large corporations to manage financial risks and meet environmental goals. Companies that cannot physically receive energy, have multiple trading points, or are concerned about the profile risk in physical PPAs (cPPAs) often choose vPPAs, enabling them to achieve sustainability goals.

How Does a vPPA Work? A vPPA acts as a price hedging tool and involves settling the difference between the market price and the contract price. This allows companies to flexibly manage energy costs. Virtual PPAs enable corporations to fulfil their environmental commitments without the need for physical energy delivery.

This approach allows companies to generate positive environmental impacts while meeting the expectations of stakeholders, investors, and consumers who demand sustainable actions. Ultimately, this results in an increase in renewable energy capacity.

Structure of Contracting Parties and the Importance of ESG

Seller: A Special Purpose Vehicle (SPV) is often the owner of the PV project. The SPV is responsible for project management and financing, which helps minimise risks.

Buyer: Large corporations and energy suppliers purchase energy from projects to support their environmental goals. These two types of buyers are presented together because they compete with each other in the market.

Financial Guarantee: Financial security acts as a guarantee that the project will be managed responsibly.

Forms of Financial Security and Their Role in Sustainable Development

Financial securities, such as Parent Company Guarantees and bank guarantees, are the most common solutions. They minimise credit risk and enhance the project's credibility. These securities are proof of the project's financial stability, increasing its value in the eyes of investors. While guarantees are often reciprocal, it is generally the buyer's responsibility to provide them.

Benefits of PPA and vPPA for Renewable Energy Projects in the Context of ESG

1. Emission Reduction: Corporations can fulfil their climate commitments through PPAs and vPPAs.
2. Transparency and Corporate Governance: These contracts help companies achieve ESG goals while ensuring financial stability.

Contract Duration

The duration of a PPA typically spans around 10 years to allow for debt amortsation and investor return. However, buyers, especially corporate ones, are increasingly requesting shorter terms of 5, 7, or even 3 years.

For shorter contracts, the producer must carefully analyse the expected financing model, particularly if it depends on anticipated returns after the initial PPA term.

From the producer's perspective, 3-year contracts are not bankable and cannot facilitate refinancing of such investments. In Poland, only two banks allow the contracting of 5-year agreements. However, the problem for producers extends beyond degradation of the generation profile; it also includes the post-5-year period, while the lifespan of the asset is estimated at 20-25 years.

A PPA becomes binding on the date of its signing (often referred to as the "Effective Date"). This ensures that the buyer will purchase energy once the project is built and that the project owner will construct the project and sell the energy exclusively to the buyer.

Commercial Operation Date (COD)

The PPA term usually begins on the effective date, but its duration is often referenced against the Commercial Operation Date (COD). In other PPAs, the delivery period begins on the COD and continues for a specified number of years.

The COD often marks the beginning of energy deliveries under the PPA. It determines whether the project avoids penalties by achieving the "Guaranteed COD" and establishes when the price transitions from the "test run rate (spot)" to the "contract rate". Therefore, it is crucial to clearly define the COD.

Generally, the Commercial Operation Date is defined as the date when the entire or a specific portion of the project, along with all necessary components required for operation and energy delivery to the transmission system, have been tested, commissioned, and are both authorised (production license) and operational.

Parties often negotiate detailed standards for evaluating whether specific project milestones have been met, imposing penalties for delays.

In most cases, the COD is defined in a way that allows the project owner to achieve commercial operation even if not all units expected in the PPA are installed. For instance, a PPA may require an installed capacity of 50 MW, but the project is implemented in stages, and the completion of the last 5 MW farm is delayed. Such PPAs require the seller to continue developing the project until the total installed capacity reaches commercial operation.

If the seller achieves commercial operation for the core part of the project but fails to complete the remaining part, they may be liable to the buyer for contractual damages due to insufficient capacity.

The ability to declare commercial operation for part of the installed capacity can also benefit developers in cases of partial force majeure, connection delays, or unforeseen permitting or land issues, which can impact timelines related to tax credits.

Termination of the Agreement Before the Commercial Operation Date

PPAs include "exit provisions" that allow the buyer to terminate the PPA if certain events occur or fail to

occur. The most common early termination provision in a PPA is related to project construction delays. Developers should carefully consider the schedule of expected development costs they will incur to advance the project while the buyer retains the right to terminate the agreement.

In other words, the developer should not be obligated to incur significant costs, let alone begin construction, before the buyer is fully bound to the PPA. Therefore, the buyer's termination right should have a clear deadline, allowing the developer to align their schedule.

In cases where the buyer can terminate the agreement after the seller exhausts their right to pay delay compensation, special attention must be paid to limiting the developer's liability and capping buyer compensation to already paid delay damages or another clearly defined amount.

If the producer/developer fails to achieve commercial operation by the specified Expected Commercial Operation Date, the producer is usually liable to the buyer for compensation for each day of delay up to the earlier of two dates: the commercial operation date or the maximum delay period. Upon expiration of the maximum delay period, one or both parties have the right to terminate the agreement. The seller may then be required to make an additional payment as liquidated damages or a termination payment calculated with the seller as the breaching party.

Contract Rates and Pricing Structure

The energy price is the most critical element of a cPPA, and its structure can vary. The price may:

- Remain fixed throughout the agreement,
- Increase over time,
- Include additional features.

An escalating price is often set at the beginning of each new "contract year", motivating the seller to start commercial operations as soon as possible to secure the initial price and the planned rate increase.

A test-run energy rate applies during the period when the project is not yet fully completed but has started generating energy partially. In this case, the producer already implements a balancing agreement with a balancing entity. In some European energy markets, the producer may sell this energy directly to buyers instead of dumping it on the spot market (fixing 1).

Virtual or Financial PPAs (vPPAs)

Virtual PPAs (vPPAs) are contracts for differences where the buyer agrees to pay the difference between the negotiated reference price and the market price. These agreements are not tied to the direct physical supply of electricity. All Guarantees of Origin arising from this relationship are transferred to the buyer.

Virtual PPAs protect both the buyer and the producer from market price fluctuations by setting the PPA price at a mutually agreed level:

- If the PPA price is lower than the market price, the buyer agrees to pay the difference.
- Conversely, if the market price drops below the PPA price, the producer refunds the difference.
- This structure ensures stability for both parties and shields them from energy market volatility.

Greenfield Projects

In Greenfield projects, the project owner is responsible for the development and construction of the project. A significant part of the negotiations revolves around what the seller will or will not be obligated to do to develop the project, as well as what "exit rights" each party will have if the project fails to achieve specific milestones.

The buyer is typically interested in ongoing project progress, as they need to know when the energy will be delivered or when they will need to take a hedging position. As a result, a PPA often requires the owner to regularly provide status reports on permitting and construction progress.

Milestones and Delay Penalties

PPAs commonly outline key project milestones, such as securing financing, ordering components (e.g., panels), obtaining required permits, securing a grid connection agreement, and ultimately achieving commercial operation readiness. If the seller fails to meet these milestones, the buyer may have the right to:

- Terminate the agreement,
- Claim delay damages, or
- Request additional financial securities.

From the project owner's perspective, it is important to limit the number of milestones and introduce some flexibility, especially if a delay in one stage does not directly affect the project's overall completion date.

An optimal solution for the seller would be for the buyer's sole remedy to be contract termination without claims for damages—however, such a structure is rarely accepted. Buyers are concerned that this would give the project owner an easy exit without accountability.

A common compromise is to establish delay penalties that the seller must pay up to a specific capped amount. These limits are often linked to the credit security provided by the seller during the project's development phase. This structure motivates the producer to complete the project as quickly as possible while protecting the buyer from the impacts of prolonged delays.

Performance Maintenance

While renewable energy owners prefer PPAs based on a "pay-as-produced" model—where they sell all energy that the project actually produces—most current agreements require the seller to provide additional performance guarantees. These guarantees compensate the buyer for substitute energy costs and Guarantees of Origin if the project fails to meet agreed performance standards.

Production Guarantees

Under a PPA, the seller may commit to achieving a specific energy production level. If the project fails to produce the agreed amount of energy within a defined period, the seller must compensate the buyer. When calculating production, losses caused by factors such as force majeure, transmission constraints, or planned maintenance are typically accounted for.

Availability Guarantees

These guarantees ensure that PV installations in the project are operational and available for a specified percentage of time, typically ranging from 50% to 90%. Time lost due to force majeure, transmission constraints, and planned maintenance is excluded.

Contractual Damages

If the project does not meet performance guarantees, the PPA provides a mechanism for calculating compensatory damages:

For production guarantees, the damage is calculated as the shortfall of generated energy in MWh compared to the guaranteed value.

For availability guarantees, the damage is calculated as a percentage shortfall in availability compared to the guaranteed level.

Rights to Terminate the Agreement

To safeguard against long-term underperformance of the power plant, the PPA may grant the buyer the right to terminate the agreement if production or mechanical availability falls below a defined minimum level for a specified period.

Force Majeure

A PPA specifies situations in which the producer may curtail energy production. For example, the renewable energy owner may have the right to reduce deliveries in the event of an emergency at the power plant. Force majeure events—situations beyond the parties' control—may justify a failure to fulfil obligations under the agreement. For instance, if a natural disaster damages a transformer, the seller may be temporarily exempt from delivering energy until repairs are completed. However, the party responsible for maintaining the affected component must take immediate corrective action.

Force majeure clauses have become a focal point of negotiations, particularly since the COVID-19 pandemic and disruptions in supply chains. A well-drafted clause should clearly distinguish between situations that are "excusable" (relieving the party from fulfilling the contract) and those that are "risks" assigned to a specific party. Energy price fluctuations or an inability to make payments should not be considered force majeure. The clause should include a list of events agreed by both parties as force majeure and those explicitly excluded. For prolonged force majeure events, the parties may also define conditions for contract termination.

Breach Clause

The breach clause specifies the timeframe within which the defaulting party can remedy the breach. If the breach is not corrected within the specified period, the innocent party may have the right to termi-

nate the agreement, pursue legal claims, or suspend their obligations. The clause may also limit available remedies or set liability caps, particularly for breaches occurring before the project's commercial operation date (COD).

Lenders and Equity Investors

Even if the project is directly financed off the developer's balance sheet, the PPA typically includes provisions allowing it to be assigned as collateral for project lenders. Consequently, PPA contracts often contain clauses permitting the renewable energy owner to use the PPA as collateral and requiring the buyer to provide all necessary approvals and documents. These provisions grant lenders additional protections, such as the right to extend time for fixing potential breaches.

Buyer Purchase Options

Interest in owning renewable energy sources is increasing among energy sellers in Poland for the same reasons driving interest on the buyer's side—ESG goals. PPAs often include an option for the buyer to acquire the project or the SPV after a defined period. These options should be carefully designed and aligned with the buyer's investment strategy.

Price Hedging Mechanisms

Contracts for differences, such as vPPA, involve an agreement between parties on a fixed energy price. If, at the time of production, the market price (SPOT Fixing I) exceeds the reference price, the energy producer pays the counterparty the difference between the market price and the reference price.

Hedging typically covers only part of the anticipated energy production, with the remainder sold on the open market. The portion of production subject to hedging depends on the risk assessment conducted by the parties (developer, lenders, and buyer), considering the project's financial stability. In certain cases, a hedge agreement allows the developer to curtail energy delivery during specific periods of the year.

Guarantees of Origin are integrated into the hedge agreement. This solution is attractive to large Polish industrial buyers seeking to "green" their energy consumption and protect themselves against market price volatility. The developer/producer/owner can enter into a hedge agreement either directly with the end buyer or with a domestic energy seller, who in turn signs a similar agreement with the end buyer.

Additional Security Requirements

As with securities required in cPPAs, hedging agreements also require guarantees, such as bank guarantees or Parent Company Guarantees (PCG) with high credit ratings. The amount of security depends on the risk assessment borne by the hedge producer, considering the project's specifics and the market in which the hedge is executed.

In hedging scenarios, the developer may also be required to provide additional collateral if the market price exceeds the reference price.

Regulatory Requirements

Energy hedging in Poland is subject to EU regulations and national financial market laws. For hedging on international markets, additional regulations, such as the Dodd-Frank Act in the USA, may apply. This includes requirements for the registration and reporting of swap transactions. In Poland, reporting obligations under the EU's EMIR regulations fall on the contracting parties. ◢

Alternative ways to decarbonise real estate

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The transformation of real estate towards decarbonisation is inevitable. Rising market expectations and dynamic regulatory changes mean that highly energy efficient buildings are slowly ceasing to be "icing on the cake" and becoming a "must have." Decarbonisation does not have to involve the reconstruction of an entire building or an expensive undertaking. Projects implemented with involvement of the public funds or being under the monuments' preservation protection, are good examples of how to approach decarbonisation in economic and innovative way.

Public entities are supposed to be an example

In just 3 years (starting January 1, 2028), all new buildings owned by public institutions are expected to qualify as zero-emission buildings[1]. Such buildings will be only those with a very high energy rating, requiring zero or little energy, not producing CO_2 emissions from fossil fuels on site and emitting other greenhouse gases only minimally. Other building owners have five years to achieve this standard (until January 1, 2030). There is also little time to introduce national regulations to achieve these goals. The EU member states must implement it by May 29, 2026.

Gas boilers after January 1, 2025 can also be used

Dynamic amendments and the relatively short deadlines for their implementation, are a big challenge to the market players. Ensuring the economic success of the project has to go in hand with its compliance with EPBD and the national regulations that will be introduced in its implementation.

On top of the current regulatory gap, there is the challenge of obtaining external financing. Such financing is desired even by the public entities, in residential projects, among others. The conditions for obtaining external financing, are often even stricter, as the financial institutions themselves are subject to non-financial reporting obligations dictated by SFDR[2] and Taxonomy[3]. For a developer,

1 In accordance with the EU Directive 2024/1275 on the energy performance of buildings Directive of the European Parliament and of the Council (EU) 2024/1275 of April 24, 2024 ("EPBD")

2 EP and Council Regulation 2019/2088 on disclosure of information related to sustainable development in the financial services sector

3 EP and Council Regulation 2020/852 on establishing a framework to facilitate sustainable investment

There is persistent misinformation that the use of gas-fired boilers for heating purposes in buildings is banned from 1 January, 2025. Meanwhile, from the date indicated, Member States are to stop providing financial incentives for the installation of individual boilers powered by fossil fuels

third-party financing is often the only way to implement an investment. Projects are being implemented today but will be completed in a few years, yet they already must meet the future expectations of financing institutions. Thus, when planning an investment today, the developer must design and implement projects in a way that ensures they will meet the heightened requirements in the future – specifically at the time the investment is completed.

As of today, a lot of financing is granted only if, broadly speaking, numerous ESG conditions are met. Among other things, the energy efficiency index is important, the lower the carbon footprint – the better. The most desirable projects are the ones which can be labeled as the zero-emission. In addition, subsidies from the KPO (National Reconstruction Plan) fund are granted with preference to the "green" solutions. Consequently, it became "a must" for the investors to implement only such solutions that will fit into the above requirements.

We are in a transitional period, thus precise analysis of legal provisions and exceptions is a key to assess whether a given investment qualifies for green financing. Unfortunately, there are many imprecise interpretations – such as the one claiming that it is not possible to subsidise investments if they involve fossil gas furnaces.

For example, wrongful information persists, that as of January 1, 2025, the use of gas boilers in buildings or heating purposes is banned. Whereas, as of the aforementioned date, member states must not financially incentivise the installation of individual fossil fuel furnaces. Additionally, pursuant to the EPBD – financing for the installation of individual gas boilers will be allowed to continue if they are selected for investment by the end of December 31, 2024, in accordance with relevant EU regulations.[4)]

Due to numerous ambiguities, on October 18, 2024, the European Commission issued a notice on withdrawal of financial incentives for individual fossil fuel boilers[5)]. The Commission distinguishes between individual boilers and "hybrid heating systems with a significant share of renewable energy, such as a combination with solar thermal or a heat pump". The use of the second type of the latter (hybrid solutions) is permitted. Thus: combining gas boilers and renewable energy sources or renewable energy sources and cogeneration.

Further, the notice clarifies that non-fossil renewable sources include wind energy, solar energy (thermal and photovoltaic) and geothermal energy, diffusion energy, ambient energy, tidal, wave and other ocean energy, hydropower, biomass and gas from landfills, wastewater treatment plants and biological sources

4 In accordance with EP and Council Regulation (EU) 2021/241, 2021/1058, 2021/2115

5 Notice Commission C/2024/6206: https://eur-lex.europa.eu/legal- content/EN/ALL/?uri=CELEX:52024XC06206

(biogas), as well as renewable fuels: biofuels, bioliquids, biomass fuels and renewable fuels of non-biological origin.

Whether a furnace runs on fossil fuels (by definition) can also depend on the fuel mix of the gas network at the time of installation. In some EU countries gas furnaces are connected to gas installations in which "mixed gas" (fossil and renewable fuels) flows. In such cases, in order to be compliant for the financial subsidies granted at a given member state, it is sufficient that the furnace is connected to a network in which a mix of gas flows. In Poland, on the other hand – there is no blended mix of renewable gases in the gas grid. Consequently, to avoid classification of a furnace as "fossil-fueled" (thus ineligible for funding) it will be necessary to combine them with the use of renewable energy, such as solar or a heat pump, which will provide a significant portion of the energy production. Therefore, it cannot be unequivocally argued that gas furnaces cannot be used in development projects at all.

AI in technical systems as an important support in improving energy efficiency

Digitisation is an important driver of energy efficiency and demand side flexibility in buildings. "Smart" buildings use advanced sensors and controllers, systems integration, data analytics and energy optimisation to actively reduce energy consumption and demand while improving occupant comfort, health, productivity and facility resilience. Embedding digital solutions in "smart" equipment and appliances can ensure also other benefits, including improved reliability and remote management, as well as reductions in energy consumption and emissions.

The potential energy savings which can be achieved through smart buildings can be significant. Basic automated building control systems can save 10-15% of energy in commercial buildings. More advanced features, such as demand-controlled ventilation, can save an additional 5-10% of energy. Integrating building systems together[6] – according to conservative estimates from the American Council for an Energy-Efficient Economy[7] – can provide additional energy savings of an average of 8-18% compared to basic HVAC and lighting control through the use of smart technologies[8]. Energy information management systems that use advanced metering infrastructure and monitor end-use consumption in buildings can save an average of 3%, while automatic fault detection and diagnostics can save an average of 9% of energy consumption[9].

Taking into account the above-mentioned information, as well as experiences from Poland, it can be considered that, depending on the initial level of technical sophistication of the building, its age and the technical specifications of the building systems, the level of savings obtained from the application of the above-mentioned solutions will range from about 25% to even 50%, and in some cases even more. The aforementioned effects are also influenced by many factors other than physical ones, such aspects e.g.: location, immediate surroundings and climatic conditions of different regions of Poland will be relevant here.

One of the 2019 research reports suggests that network-interactive efficient buildings[10] can reduce energy costs by up to 20% through active demand management. This is another category of savings that can be generated. Energy optimisation can control a building's energy consumption based on the CO_2 intensity of the grid in real time and coordinate

6 Cf. Achieving Deeper Energy Savings through Integrated Building Systems. Emerging Opportunities Series. American Council for an Energy-Efficient Economy available at: https://www.aceee.org/sites/default/files/eo--smart-buildings.pdf. Accessed on 04/11/2024.

7 https://www.aceee.org/about-us.

8 These are averaged values. The actual benefits of AI--based solutions are highly dependent on factors such as the size of the building, the initial CAPEX, the complexity of the technical systems, how the building has been used by tenants to date, and the existing operating settings of the building systems, among others. Many times these savings reach 20-30%, and occasionally as much as 40%.

9 Cf. C. Nesler, K. Poh Lam, B. Lasternas, How to build smart, zero carbon buildings – and why it matters available at: https://www.weforum.org/stories/2021/09/how-to--build-zero-carbon- buildings/ (accessed on 03/11/2024) and Smart energy analytics are key to building energy and cost savings available at: https://betterbuildingssolutioncenter.energy.gov/beat-blog/smart- energy-analytics--are-key-building-energy- and-cost-savings (accessed on 04.11.2024).

10 Cf. C. Carmichael, M. Jungclaus, P. Keuhn, K. Porst Hydras, Value Potential for Grid-Interactive Efficient Buildings in the GSA Portfolio: A Cost-Benefit Analysis available at: https://rmi.org/insight/value-potential-for-grid-interactive-efficient-buildings-in-the-gsa-portfolio-a-cost-benefit-analysis/ (accessed 04/11/2024).

the use of clean heating with backup fossil fuel appliances to minimise CO_2 emissions 24/7, while providing flexibility and demand resilience.

Gas reversible absorption heat pump as one of the solutions with high energy efficiency parameters, including in historic buildings

Providing a "low-carbon" heat supply to older or historic buildings can be particularly challenging. In such buildings, interference with a building envelope or the exterior facade may be precluded for technical reasons or the need to preserve the historic qualities of the building (conservation restrictions).

In practice, a comprehensive modernisation of internal heating systems in such buildings – is not always necessary. In place, where it is impossible to connect to the municipal heating network (e.g., there are no technical and economic conditions for connection to the network and energy supply), but there is an option to connect to the gas network or there is a gas connection on the property – it is worth reaching for alternative gas solutions. For example: installation of a set of several gas reversible absorption heat pumps (i.e. receiving additional heat from the environment (air or ground) connected to gas boilers), which will supply the building with both heat and domestic hot water. Such technology enables significant benefits: reductions in primary energy consumption, reduction of CO_2 emissions, use of renewable resources (enthalpy of outside air meeting the definition of "ambient energy" mentioned in the Directive on the Promotion of the Use of Energy from Renewable Sources), energy cost savings compared to a traditional solution based on a gas furnace[11)].

This can be a particularly attractive solution for older, particularly historic buildings, where the possibility of insulating the building facade is severely limited by conservation guidelines. Improving energy efficiency in such buildings requires an alternative solution. Such buildings may not require elimination of the existing, internal heating installations. As audits carried out in existing buildings have shown, internal central heating networks can maintain good parameters for providing thermal comfort[12)], which makes it possible to abandon their liquidation or minimize the

11 Cf. publication: https://cordis.europa.eu/project/id/285158/reporting.

12 The prerequisite for leaving them is to make sure that: insulation of the existing system is sufficiently high (i.e., the central heating system is properly insulated – there are no significant heat transfer losses in the building), there are properly selected radiators (in terms of power, size and location), there is optimised heating power, there are heating control solutions, including those allowing individual control of thermal comfort.

DECARBONISATION

Decarbonisation is a major challenge for the real estate industry. Investors, aiming for zero-carbon from 1 January, 2030, have to plan building developments, so to speak, ahead of the regulations that are yet to be introduced.

necessary expenditures[13], and thus saving the cost of investment.

For historic buildings to ensure peak power on very frosty days, a condensing gas boiler may be the solution. While removing additional heat from the flue gas, it ensures adequate temperature performance and lower heating costs. However, to ensure that the gas boiler does not negatively affect the energy efficiency assessment of the building, it is advisable that it is at least a hybrid solution.

In order to achieve the above, the gas boiler can be combined with renewable energy sources, by supplementing it with photovoltaic installations. Fixing the RES installations on the building's exterior may, however, be a challenge, in particular, when there is an obligation to preserve the building's historical character. Fortunately, adequate solutions are already available on the market (including from Polish manufacturers) which address such problem. For example, photovoltaic panels can be integrated into the roof in a colour imitating the traditional colour of roof tiles. This should make it easier to obtain the required conservation approvals.

Gas heat pumps can also be attractive where the cost of construction a bottom source of heat with ground source heat pumps would be very high or impossible. This may result, for example from the space constraints on the plot (collision with other land use elements, close, densely built-up city centers), geological conditions (e.g. ground water and its level), or the size of the project.

To improve the operation of the entire system and meet the EPBD requirements, this system should be expanded with a solution based solely on renewable energy (in particular, photovoltaics), heat recovery from exhaust air or wastewater. Heat storage for the provision of domestic hot water, for example, could also offer very good prospects.

13 It may be advisable to conduct an energy efficiency audit of the heating system in order to perform specialised tests and measurements tailored to the specifics of the project necessary to make recommendations for actions that take into account payback time of the investment and the period of achieved savings. It is also worth mentioning that the execution of the aforementioned audit is necessary to obtain energy efficiency certificates, the so-called "White Certificates", which can further improve the profitability of the project.

At this point, it is also worth mentioning the minimum energy performance standards (MEPS) for buildings – to be set individually by each member state, in accordance with the EPBD. Indeed, under the "discretionary slack" left to local legislators, differentiated MEPS can be set between new and existing buildings and between different categories of buildings[14]. In addition, member states may decide that MEPS will be specifically tailored to buildings under official protection or due to their special architectural or historical values, as long as compliance with the specified minimum requirements would unacceptably alter their character or appearance[15].

Examples of the use of gas heat pumps can be found in the buildings of The Lowford Centre in Bursledon, the Open University in Milton Keynes in the UK, the Administration Center in Zwevegem in Belgium, the elementary school in Plaidt in Germany, the Scania building in Oberschleißheim in Germany, and the Cambridge University Boathouse.

Application of modern thermal insulation in thermal modernisation of historic buildings

At a time of shrinking investment real estate resources in cities, brownfield developments are becoming increasingly popular. Unfortunately, many of the post- industrial buildings from the period of industrialisation in the 19th/20th century are under conservation protection. Here, for example, the investor's need to preserve historic facades (e.g. brick) can be a challenge.

Conservation restrictions on the facades may require a thermal insulation to be placed from the inside, which can be crucial to maintain an adequate so-called dew point. Internal thermal insulation and its physical properties and ability to accept and release condensate throughout the partition, are particularly important in spaces where there are exterior walls (separating the tenant space from the external environment). Increasing the thickness of these walls as a result of insulation, may be undesirable (because it will reduce the leasable area of the GLA), so an important criterion here may be the use of materials that prevent the occurrence of the aforementioned

14 Article 5(1) EPBD

15 Article 5(2) EPBD

condensation, whose thickness is as small as possible and the thermal insulation effect as large as possible.

An example of a material worth considering are products based on aerogel[16] – a material with an extremely low thermal conductivity coefficient of 0.014-0.016 W/m·K, lower than polystyrene, polyurethane foams, mineral wool or glass wool. It is available on the Polish market, for example, in the form of granules or fiberglass-reinforced mats. They can be used in hard-to-reach places and to eliminate thermal bridges[17]. Due to the flexibility of aerogel moulding, it is an excellent solution, especially where traditional solutions do not pass the test (lintels, window recesses, side mullions and other details), and can perform well in insulating buildings from the inside, in case of the need to preserve the original external decorative elements or the prohibition of external facade insulation. This material is also used by manufacturers of building materials[18] as aerogel inserts to improve the insulation and acoustic properties of windows and doors[19]. A major advantage of using this type of insulation is the significant reduction in the amount of material used compared to classical insulation materials.

Aerogel has been used as part of programs to revitalise old buildings, for example in Germany[20]. It has allowed for the preservation of the aesthetics of a building while increasing its energy efficiency[21]. Due to its high price, it is still not very popular in the construction industry, but it is hoped that this will change soon. The price of aerogel insulation over the past 10-plus years has fallen relative to traditional materials. It can be expected that with the growing interest in passive solutions in construction, its use will increase, which will translate into more mass production to the benefit of unit prices.

Microturboexpanders and turboexpanders as an unconventional way to pursue decarbonisation and improve energy efficiency

A turboexpander is a rotating machine with an expansion turbine that converts the energy in the gas into mechanical work, like a steam or gas turbine. Turboexpanders are an ideal choice for the industrial sector, in cases where there are processes, with high pressure drops, that require cooling or energy recovery. The simple and hermetically sealed design of the units usually leads to high reliability, and in some plants the same turboexpander has been in operation for many decades[22].

This solution is known and used in the gas, petrochemical, and LNG sectors around the world[23]. For example, in 2019 Italgas, the operator of Italy's gas distribution network, has commissioned Turboden for a project to install two 650 kWe gas expanders that will increase the energy efficiency of one of the main gas pressure reduction stations connecting the national pipeline network to Rome.

Gas expanders generate electricity using the reduction of gas pressure in the main transmission pipeline to that required by users, both residential and industrial. GasNet (a Czech operator) is taking similar steps in 2021 by reactivating an older expander at one of its regulating stations and is working on commissioning a prototype screw expander at the Velké Němčice station to achieve maximum efficiency in power generation.

16 Areogel is a nanomaterial, a solid with a rigid foam structure with extremely low density (more than 90% consists of air), high strength, high fire resistance, has very good acoustic characteristics.

17 Cf. http://www.antherm.at/antherm/Diplomarbeiten/Proskurnina%20Olga/BSA_AEROGEL_final.pdf

18 For example, companies in passive window and door joinery use such a solution, such as in the Midpoint71 building in Wroclaw.

19 Such a solution was used in the ZAE-Bayern building in Würzburg, Germany. Cf. M. Reim, W. Koerner, J. Manara, S. Korder, M. Arduini, H-P. Ebert, J. Fricke, Silica Aerogel Granulate Material for Thermal Insulation and Day Lighting in Solar Energy 79 (2), pp. 131-139, and its benefits are described in C.K. Leung, L. Lu, Y. Liu, H.S. Cheng, Jeff H. Tse, Optical and thermal performance analysis of aerogel glazing technology in a commercial building of Hong Kong, Energy and Built Environment, Volume 1, Issue 2, 2020, pp. 215-223,

20 E.g. https://www.gih.de/wp-content/uploads/2015/10/EnergieKOMPAKT_04-2015.pdf,

21 E.g., the Bürogebäude am Hauptbahnhof in Hamburg, the renovation of the "Haus der Kulturem der Welt" building in Berlin.

22 T. Avetian, L. Rodríguez. Fundamentals of turboexpander design and operation. Gas Processing & LNG. May/June 2020.

23 Izabela Kijeńska-Dąbrowska, Adam Przybył. Increasing energy efficiency by managing thermal waste energy in gas transportation. Gas Review. Magazine of the Chamber of Commerce of the gas industry. No. 1 (61), March 2019.

Regarding the public sector, the above-described solutions have been used by, among others, the University Clinic in Heidelberg, Germany, in cooperation with an energy company. Trigeneration (here: combined heat, steam and electricity) systems with a gas turbine and downstream boilers for waste heat and hot water provide energy for all campus facilities, which use, among other things, turboexpanders to recover energy from steam, while excess electricity produced is fed back into the grid. This will succeed in reducing energy consumption and greenhouse gas emissions[24]. The Cern Science Center in Geneva, Switzerland – one of the most important research centres in Europe in the facilities will use turboexpanders to recover energy from cooling processes and to generate electricity.

Final remarks

Decarbonisation is a major challenge for the real estate industry. Investors aiming to become "Carbon--free as of January 1, 2030" must plan buildings' development, ahead of the regulations that are yet to be introduced. The ones already implementing modern solutions, are surprised how much savings smart solutions can bring in a short period of time.

In this article we have attempted to prove how crucial it is to plan an investment in the context of the specific regulations and conditions applicable in a given country. One of the most interesting examples of such exceptions, which the member states will be allowed to introduce, are specific MEPS for non-residential buildings, including a complete waiver of this standard based on the future designation of the building, serious difficulties or in the case of an unfavourable result of a cost-benefit assessment[25]. It seems that "severe difficulties" may be of particular ground for broad interpretation. Therefore, one should not spread false impression and generalise that the goals set by the EPBD are unattainable. A careful analysis of the regulations leads to the conclusion that member states have ample scope for adjusting national mechanisms to reflect the country's climatic conditions, specifics of development, technical, functional and economic possibilities. ◢

24 Read more: https://www.eon.com/en/about-us/media/press-release/2023/eon-and-heidelberg- university-hospital-commission-largest-cooling-supply-site-in-germany.html and https://www.eon.com/en/business--customers/success-stories/heidelberg-university.html.

25 Article 9 p 1 EPBD

PUBLIC ENTITIES TO BE THE EXAMPLE

In just three years (from 1 January, 2028), all new buildings owned by public institutions are to meet the criteria for zero-emission buildings.

DIGITALISATION

Digitalisation is an important driver of energy efficiency and energy demand flexibility in buildings. 'Smart' buildings use advanced sensors and controllers, systems integration, data analytics and energy optimisation to actively reduce energy consumption and demand, while improving occupant comfort, health, productivity and resilience of the building.

Michał Brzemiński
Head of Green Transformation, Respect Energy

Green transformation of shopping centres: Sustainability and energy efficiency as a path to savings

Cost optimisation and alignment with ESG policies are among the key factors determining the competitiveness of shopping centres. To maintain a market edge, it's essential to keep rental offerings attractive – even in the face of rising energy prices – while embracing a green transformation that responds to growing environmental expectations. These two goals can be pursued simultaneously, delivering both business and reputational benefits.

Modernising energy infrastructure, combined with investments in renewable energy sources (RES), can significantly reduce energy costs, improve energy stability and quality, and increase the energy independence of a property. According to research by PwC and the Polish Council of Shopping Centres (PRCH), 65% of respondents would choose a shopping centre that follows a sustainable development policy[1)], while 87% believe that pro-environmental initiatives increase the value of real estate[2)]. The time for green transformation is now.

1 https://www.pwc.pl/pl/media/2021/2021-11-17-szescdziesiat-piec-procent-konsumentow-wybierze-centrum-handlowe-posiadajace-polityke-zrownowazonego-rozwoju-i-dbajace-o-srodowisko.html

2 https://stowarzyszeniepink.org.pl/wp-content/uploads/2024/01/ESG-2023_12_12_10012024.pdf

Green Transformation by Respect Energy

Large-format retail properties aiming to maintain both price and environmental competitiveness can now begin the “Green Transformation Process”. With full support from Respect Energy in an “Energy as a Service” model model – covering operational, technological, service-related, regulatory, and administrative aspects – clients can improve their energy efficiency and transition to green energy. The client gains both an energy partner and a subscription to green transformation. The capital investment, along with service and project-related costs, is spread over approximately ten years.

The Green Transformation Process, under the Energy as a Service model, begins with the preparation of an Energy Optimisation Report. This involves analysing building management systems (BMS), HVAC, and other electrical installations that significantly impact energy consumption profiles and usage points.

Based on this analysis, we identify the potential for implementing RES systems that can greatly enhance energy efficiency and reduce operational costs. When preparing recommendations, we take into account the client’s needs and local conditions. If the goal is a full transition to green energy, we propose suitable green systems. If the priority is lowering energy consumption metrics, we focus on optimisation.

Savings of millions with Energy As A Service

In one of our current projects, carried out for a shopping centre from Sierra Balmain’s portfolio, we estimated that energy consumption in shared areas could be reduced by up to 89%. This result was achieved by recommending various industrial automation solutions, RES implementations, and the automation of energy infrastructure management – continuously generating significant savings. This example proves that it is possible to achieve multimillion savings through energy optimisation, as well as in distribution fees and White Certificates, thanks to technological and operational solutions tailored to the client’s real needs.

65% of respondents will choose a shopping centre with a sustainable development policy

Achieving savings of millions of Euros from energy optimisation and, in addition, distribution charges or White Certificates is possible thanks to technological and operational solutions tailored to the customer's real needs.

To achieve the estimated savings, we proposed implementing Respect Energy's solution under the Energy as a Service model, called eGT (Energy Green Transformation). This will enable the shopping centre to acquire its own green energy source – such as a photovoltaic installation, energy storage systems, industrial automation, and an energy management system for both production and consumption – optimally adjusted to market conditions and TGE pricing.

Estimates show a potential return on investment (ROI) of 2,241%, with full payback by 2027. Over the course of the project, the shopping centre is expected to save PLN 9.1 million. The implementation phase of the eGT typically takes 18 to 24 months and includes infrastructure modernisation, RES system installation, and synchronisation of all systems.

By leveraging advanced industrial automation, we create an integrated energy management system that automatically adjusts energy production, storage, and sales. The system operates independently and does not require the hiring of additional personnel.

In summary, the solution to achieving 100% ESG compliance and significantly reducing energy costs in shared areas is now within reach. ◢

POLSKA RADA CENTRÓW HANDLOWYCH
POLISH COUNCIL OF SHOPPING CENTRES

POLISH COUNCIL OF SHOPPING CENTRES

We are the largest organisation representing over 200 members from the shopping places industry in Poland. Since 2003 we have been representing the members of our organisation in business, political and social issues.

ANALYSIS AND RESEARCH

- PRCH Database: the widest cyclical data research of footfall and turnover in shopping centres covering over 30% of the overall market.
- Bi-yearly “Retail Space Market in Poland” reports prepared in collaboration with leading real estate agencies including: BNP Paribas Real Estate, CBRE, Colliers, Cushman & Wakefield, GfK, JLL, Savills, Avison Young

EDUCATION AND NETWORKING

- training sessions and webinars
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- Seasonal PRCH Business Mixer attracting over 100 selected industry professionals

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- Industry insights prepared for public partners
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- Representation of the industry in debates over ESG, energy prices, Sunday trade
- Consultations and maintained dialogue with various ministries concerned

COMMUNICATION AND PR

- Daily press review with main industry topics for PRCH members
- Weekly newsletter covering most pertinent industry issues
- Ongoing information alerts of all attention worth industry issue
- 3 000 media publications of PRCH articles in 2024
- 500 posts in PRCH social media in 2024
- 4 800 followers on LinkedIn

PRCH RETAIL AWARDS AND PRCH RETAIL AWARDS GALA

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Anna Niemira-Jurek
Operations Department Manager,
Polish Council of Shopping Centres

Commercial, but different

The energy efficiency of retail centres

Poles love shopping centres – they visit them en masse not only to go shopping but also to meet up and have fun. Shopping centres are open to everyone who wants to visit them and spend time in comfortable conditions, so for these reasons it is nothing strange that so many people can be found in them, while at the same time such buildings generate massive demand for electricity.

The largest shopping centres in Poland are buildings with over 250 tenants with areas of over 120,000 sqm gla (which means they have useable areas of well-over 200,000 sqm). Throughout 2023 and 2024, over 900,000 people on average visited such centres every month.

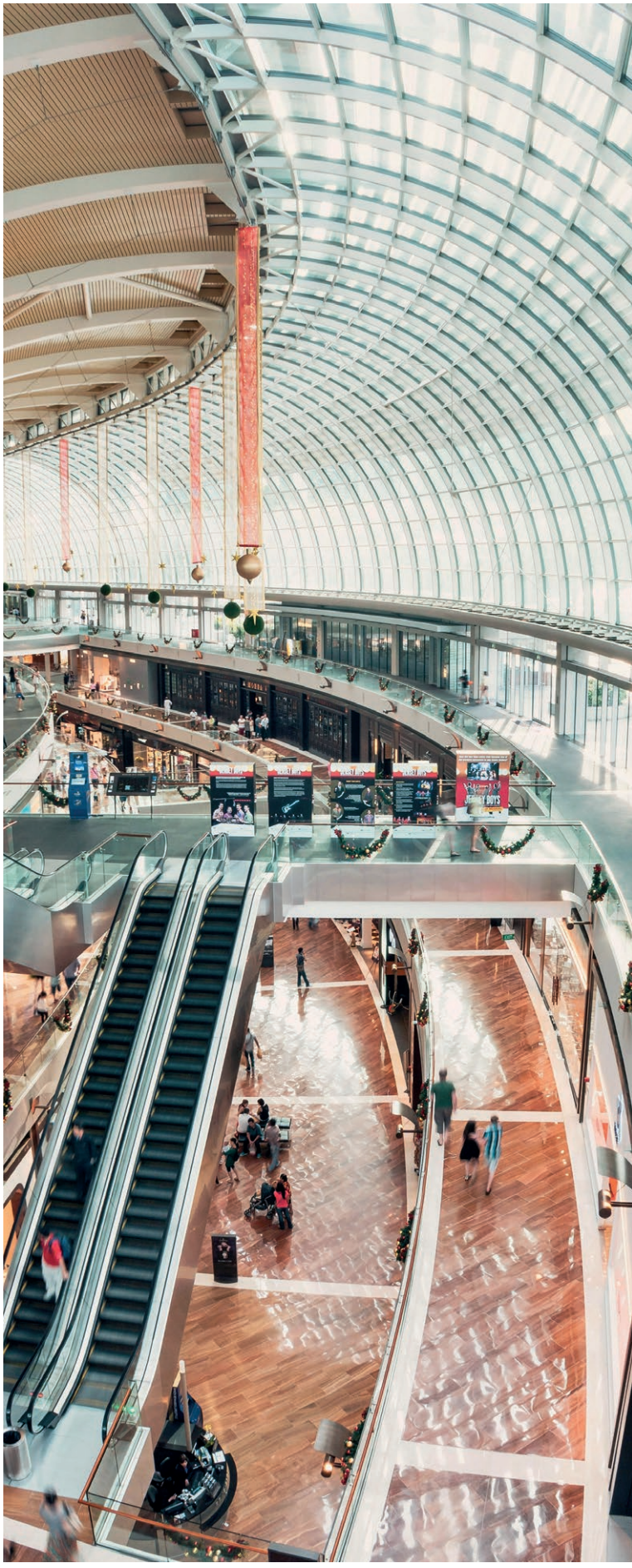
With such high footfall and so many people in one area ventilation, air conditioning, cooling and lighting systems are required to work intensively to ensure the comfort and safety of those who visit and this puts the retail in the lead when it comes to the most energy intensive sectors of commercial real estate.

Both tenants and owners of shopping centres now face the challenge of how to reduce their carbon footprint and improve the efficiency of their properties without disrupting how they function, without reducing their safety, and without changing the shopper experience. How can this be done intelligently? Meaningful savings can be achieved by introducing intelligent energy management systems, changing to low energy lighting and optimising the HVAC systems when they operate. More and more often, people are talking about rental contracts with green clauses, which are intended to make both the landlord and the tenant more aware of how they consume/use electricity.

The question of energy efficiency in shopping centres is not just how they are used but also a question of regulation. Energy Characteristics Certificates (ECC) for buildings, including retail centres, have been awarded on the basis of a new model since

2 million

– monthly number of visitors in the largest shopping centres in 2024 in Poland



the Building Energy Characteristics Bill came into law. The new rules have been in effect since 28 April, 2023 and data from these certificates about the requirement for primal energy is collated by the Ministry of Development and Technology for its Register of Building Energy Characteristics[1)].

According to announcements by the Ministry of Development and Technology, in the near future, data from the Building Energy Characteristics certificates from the register will be used to assign an energy class to every type of building. Considering the specifics of retail buildings, it seems they should be treated as a separate type of building since they cannot be compared in regard to their primal energy consumption with other types.

Thousands of people visit shopping centres every day. Shoppers come for a variety of reasons. These people also include children, the elderly, those with disabilities, and entire families looking to spend time together. We cannot neglect to mention those who work in the stores and the service centres (including those who work for the management of the centre). Managers and owners of retail centres have to take

1 https://rejestrcheb.mrit.gov.pl/wykaz-swiadectw-charakterystyki-energetycznej-budynkow

into account a broad range of user needs to provide not only safety and comfort but also decent working conditions and also meet other expectations of their tenants, whose businesses may have specific technological needs (such as gyms, restaurants, and grocery stores etc.) For example, grocery stores need a stable electricity supply for their freezers and their bakeries, restaurants must have access to hot plates and ventilation, jeweller's need appropriate lighting, and electronics stores need to have demonstration equipment switched on.

Moreover, a retail centre's operations have to adapt to dynamically changing footfall during the day and over the week, which results in specific needs for its energy usage and building management. Unlike office buildings or government offices, where the footfall is predictable and limited to just a few hours during the working day, retail centres operate in a continuously changing way and adapt to their users activity cycles, normally from the early hours of the morning till late at night.

Energy efficiency and the number of people using a building

Data from the Polish Council of Shopping Centres (PRCH) confirm that shopping centres are some of

the most visited public places in Poland. The number of visitors to a shopping centre was on average 410,000 a month in 2023 according to PRCH data and over 412,000 in 2024. This is more people than the population of Szczecin. For extremely large centres of over 60,000 sqm GLA, the average number of visitors per month was 931,406 in Poland in 2023 for each centre and 948,000 in 2024. In some months, the largest centres managed to attract up to 2,000,000 people.

Such high footfall results in a necessity to ensure user comfort but also in higher energy usage than other commercial properties such as office blocks and warehouses.

Five reasons for high energy usage in retail centres

1. **The systems in a retail centre**
   Ventilation, heating, air conditioning, and also interior and exterior lighting are the biggest users of energy in a shopping centre, Additionally, there are cooling systems essential for keeping food (with grocery and restaurant tenants), electrical installations for store equipments and building management systems (BMS). Due to the operational specifics, energy usage is not spread evenly over the day or the week. At peak times, when footfall is high, energy usage is at its highest, which requires appropriate management of the HVAC systems and for their usage schedule to be optimised. As a result of global climate change, managers also have to deal with the effects of unpredictable weather and particularly high temperatures causing glazing to heat up.
2. **Useable space**
   Retail centres and in particular shopping and outlet centres are characterised by having a large amount of useable space, which is due to having to serve a large number of shoppers and having to provide them with easy access to common areas, to attractive product displays, and the services of the tenants. One centre may contain from a few dozen to over 200 stores and service points including restaurants.
3. **Construction elements**
   A further factor that affects energy usage are the walls, roofs, and facades. Many shopping centres have large glazed areas that improve the building's aesthetics and illuminate the interiors but they can also lead to heat loss during the win-

ter and excessive heating in the summer. Solutions are available on the market such as glass with high thermal insulation and intelligent heat management systems, which can significantly improve the energy efficiency of such buildings. These, however remain costly solutions and their effectiveness is limited.

4. **The age of the building**
   You also have to remember that shopping centres have been developed in Poland over the last 30 years, which means that older buildings can be less energy efficient in comparison to modern constructions since the construction standards and the technology used in construction have changed over this time. This is true of the buildings themselves and the stores leased within them where you can still find (although now only rarely) inefficient lighting and equipment.
5. **Tenant requirements and shopper expectations**
   Ventilation and air conditioning are two of the biggest consumers of power in shopping centres. A large number of people in an enclosed space requires air to be continuously exchanged, which results in high power use. There is a further requirement to circulate the air resulting from the activities of certain tenants – restaurants, fitness clubs, and supermarkets, as well as other tenants who expect higher levels of ventilation and brighter lighting.

Conclusion

Shopping centres form a unique category of commercial building that is different to other properties due to its use, footfall, and energy requirements. The way they function requires a strategic approach to managing energy use and how the growing number of ESG requirements are applied. On the one hand, legislation is of critical importance to energy efficiency, as well as the methodology of how energy efficiency is calculated for different buildings. On the other hand, so is optimising the work schedule of installations and using solutions to improve the efficiency of HVAC and lighting systems. Above all what is required is for the tenants and the landlord to work together.

The challenge for Polish legislation, but also for the entire real estate sector, is the question of the methodology behind preparing ECCs and how appropriate they are, particularly when we consider how exceptional the aforementioned specifics of shopping centres are when compared to other non residential buildings in Poland. The consequences will likely go beyond mere inadequacy because banks and financial institution already examine CEEs for buildings today and soon they will become a crucial source of data for the energy efficiency of buildings.

It seems therefore that what is key is not only a precise understanding of the opportunities and limitations for renovated buildings, the metering of installations and the use of work schedules for their operation, but also a thorough analysis of the necessary methodology of determining the usage of Primal Energy, Final Energy, and Useable Energy, as well as above all a comparison of these factors for retail properties exclusively with buildings of the same type – with the same needs, laws, limitations and requirements. ◢

Tenants and retail owners alike face a challenge today: how to reduce the carbon footprint and improve the efficiency of a property without losing functionality, without affecting safety or the consumer experience, and... how to do it head on

ESG
FOR COMMERCIAL PROPERTY 2024

available at:

- www.stowarzyszeniepink.org.pl
- www.prch.org.pl

Decarbonising Europe's building stock

From Policy to Practice: EPBD, Level(s), and RICS WLCA

The Energy Performance of Buildings Directive (EPBD) is a key piece of legislation in Europe's effort to become the first climate-neutral continent by 2050, including the decarbonisation of all buildings. The EPBD introduces zero-emission buildings (ZEB) and aims to renovate 75% of the inefficient building stock within the next 25 years. With 85% of EU buildings predating 2000 and 75% performing poorly, urgent action is essential. For the first time, the EPBD requires the calculation of buildings' Global Warming Potential (GWP) across their lifecycle using Level(s), the EU's sustainable building framework. This data will now be reflected in energy performance certificates for new buildings.

RICS has been advocating for measuring whole-life carbon in all buildings through our Whole Life Carbon Assessment (WLCA) for the Built Environment standard. First introduced in 2017 for the UK, the second edition, updated in 2023 after extensive consultation, is now global. It provides a consistent methodology for measuring and managing lifecycle carbon emissions in construction and infrastructure projects.

Recognised as a world-leading standard, the RICS WLCA aligns with Level(s) and offers transparent guidance for a low-carbon future. It is designed for members and stakeholders, linking RICS standards to EU sustainability goals.

The document is aimed at members but also stakeholders more broadly. The intention was to create a document that explains how our standards relate to Level(s). The main objective is to highlight the compatibility of our standards with Level(s) and to explain why they can be complementary.

What is a whole-life carbon assessment?

Buildings and infrastructure contribute to human-generated greenhouse gas (GHG) emissions throughout their lifecycle, including construction, use, and end-of-life phases. These emissions, measured as CO_2 equivalent (CO_2e) in terms of their GWP are commonly referred to as "carbon emissions". Whole life carbon (WLC) encompasses all GHG emissions and removals associated with an asset, including potential benefits and loads after disposal, such as carbon savings from material reuse. WLC is categorised into embodied, operational, and user carbon:

Embodied carbon: Associated with materials and construction processes, divided into upfront, in-use, and end-of-life emissions.

Operational carbon: Arises from energy use, water supply, and wastewater treatment during an asset's use phase.

User carbon: Generated by users of a building or infrastructure, excluding operational energy and water use. Examples include emissions from commuting to an office building or vehicles using a road after construction.

The WLCA must follow a methodical and systematic process, which is defined in the RICS WLCA standard. This process is organised by using information modules to structure assessment and reporting.

The RICS WLCA

The RICS Whole-Life Carbon Assessment standard builds upon the high-level principles of EN 15978, ad-

dressing its lack of specificity with detailed, practical guidance. Originally launched in 2017 and widely adopted in the UK, the updated 2023 edition expands global applicability for both buildings and infrastructure. It ensures consistency and accuracy through prescriptive rules and a structured methodology.

The WLCA 2nd edition is a comprehensive standard for whole-life carbon assessments. It complements national and regional frameworks and aligns with internationally recognised standards, such as EN 15978, EN 17472, EN 15643, EN 15804, the International Cost Management Standards (ICMS) 3rd edition and ISO standards.

The WLCA standard is designed to enable a wide range of professionals to measure and manage carbon emissions reliably and consistently, including:

- Quantity Surveyors, Cost Consultants, and Building Surveyors: Supporting decisions to limit the lifecycle carbon impact of projects.
- Designers and Engineers: Incorporating carbon considerations into designs and processes.
- Contractors and Developers: Ensuring consistent reporting to meet government and client demands for net-zero construction.
- Financial Decision-Makers: Providing investors, lenders, and others with a long-term view of carbon and cost across the asset lifecycle.

Some European countries have been establishing their methodologies for building-level WLCA. These can be expected to be based on EN15978 and are likely to be compatible with the framework set out by Level(s).

Level(s) is an EU-developed framework to assess and improve the sustainability performance of buildings, supporting the transition to carbon neutrality. It provides a free, standardised system to evaluate materials, water, health, comfort, and climate impacts across a building's lifecycle. Level(s) provides a broad framework for assessing sustainability, encompassing six macro-objectives (carbon, materials, water, health, comfort, and climate impacts), while the RICS WLCA standard focuses exclusively on GHG emissions throughout the asset life cycle. Both frameworks are based on global standards, including ISO 14040/44, EN 15804, and EN 15978. Compared to Level(s), the RICS WLCA standard is more prescriptive and focused on measurement, offering a robust framework for consistent global application. The methodology marks a significant evolution in carbon measurement by considering emissions throughout a built asset's entire lifecycle from conception and design to construction, operation, and decommissioning. Compared to other methodologies, the RICS WLCA Standard:

Presents a more granular breakdown of lifecycle, for a more precise allocation of emissions across all lifecycle stages.

1. Covers both buildings and infrastructure projects
2. Determines complexity and detail of WLCA depending on project stage, increasing requirements from early-stage design to post-completion assessment
3. Provides rules for appropriate allocation of emissions to lifecycle stages when assessing retrofits, demolitions, and extension projects
4. Provides rules for clear delineation of project boundaries
5. Integrates numerical method to assess WLCA uncertainty (considering project stage and data quality) and produce an uncertainty factor (i.e. a % uplift to the 'base' WLCA results)
6. Provides guidance for specific aspects of WLCA, such as decarbonisation scenarios, treatment of biogenic carbon, carbon offset and storage

The EPBD revision: whole-life carbon provisions

The revised Energy Performance of Buildings Directive (EPBD) requires the assessment and disclosure of the Global Warming Potential (GWP) of new buildings, representing their total climate impact, including embodied carbon and operational emissions. These assessments must follow the methodology outlined in Level(s) indicator 1.2, although compatible national methods can be used. This information will be included on Energy Performance Certificates (EPCs).

Timeline:

- By December 2025, the Commission is empowered to adopt delegated acts for a Union framework for the national calculation of life-cycle GWP (Article 7)
- By May 2026, member states must have transposed the EPBD in their national legislation
- By January 2027, member states shall publish and notify the commissions of a roadmap over the introduction of limit values and targets (Article 7)
- As of January 2028, member states shall ensure that the life cycle of the GWP is calculated follo-

wing Annex III for buildings of over 1,000 sqm of useful floor area
- As of January 2030, member states shall ensure that the lifecycle GWP of all new buildings is calculated by Annex iii (article 7)

Harmonising WLCA in Europe

A harmonised methodology at the EU level is essential to ensure consistent measurement of building emissions across member states. This consistency would provide greater confidence when comparing projects across countries, facilitate fairer regulation of emissions through EU policies, and enable uniform tracking to evaluate the effectiveness of these policies. The importance of consistency can be seen in the challenges faced with the implementation of Energy Performance Certificates (EPCs), where inconsistencies between Member States created significant obstacles to using EPCs as a fair and transparent regulatory tool.

The revised Energy Performance of Buildings Directive (EPBD) designates Level(s) indicator 1.2 as the official methodology for measuring and reporting whole-life carbon (WLC). While robust in principle, this methodology lacks detailed guidance on critical aspects, such as selecting appropriate product-level data. Additionally, the mandated reporting template consolidates results into broad categories, potentially obscuring detailed insights available from more granular data. Member states are expected to augment the Level(s) guidance with additional specifics, as seen with the EPC methodology. However, this approach risks inconsistencies that could complicate comparisons and regulatory applications at the EU level.

Integrating key elements from the second edition of the RICS WLCA standard into Level(s) indicator 1.2 offers a solution. The RICS WLCA standard provides a comprehensive methodology for assessing lifecycle emissions, covering construction, use, and disposal phases. By leveraging the RICS standard, member states can develop a harmonised framework for WLC assessment, ensuring consistency and precision across the EU.

To support the European Commission in creating a harmonised WLC methodology, the EU should establish a framework applicable across member states. Where national methodologies exist, they should either align with or adapt to the EU framework. This would ensure that WLC assessments conducted under the RICS WLCA standard are automatically or easily compliant with EU requirements. Alignment could include adopting aspects of the RICS standard, such as granular lifecycle stage breakdowns, differentiation between buildings and infrastructure, detailed scope definitions, increased assessment complexity over project stages, emissions allocation rules, boundary delineations, uncertainty assessments, and guidance on biogenic carbon, offsets, and storage.

RICS is committed to supporting WLC implementation through resources such as the RICS National Playbook and the Capacity-Building Framework. Training products, including the Global Introduction to Whole Life Carbon Assessment and the WLCA Training Programme Certificate, further equip stakeholders to align with evolving EU methodologies. ◢

USEFUL LINKS

https://www.rics.org/profession-standards/rics-standards-and-guidance/sector-standards/construction-standards/whole-life-carbon-assessment

https://www.rics.org/profession-standards/rics-standards-and-guidance/sector-standards/construction-standards/whole-life-carbon-assessment/whole-life-carbon-assessment-training

https://www.rics.org/profession-standards/rics-standards-and-guidance/sector-standards/construction-standards/whole-life-carbon-assessment/whole-life-carbon-assessment-implementation-guides-and-supporting-documents

> ***RICS has been advocating for measuring whole-life carbon in all buildings through our Whole Life Carbon Assessment (WLCA) for the Built Environment standard***

Małgorzata Wilczek
FM Business Director,
Mota-Engil ATIV Polska

Environmental goals and local biodiversity – reducing the carbon footprint

The real estate sector, which generates approximately 40% of global greenhouse gas emissions, is one of the key elements in the fight against climate change. Its role is multi-faceted because both the construction process and the subsequent operation of buildings have a huge impact on greenhouse gas emissions. In response to global challenges, international organisations such as the United Nations (UN), under the Paris Agreement, have committed to action to keep the global temperature increase below 2°C and preferably below 1.5°C. The real estate industry must face the requirements set by the UN Sustainable Development Goals (SDG), in particular goal 11 on creating sustainable cities and communities. One of the elements of this goal is to provide access to energy-efficient, ecological buildings that promote the health of residents and at the same time minimise the negative impact on the environment.

Implementation of a comprehensive carbon footprint reduction strategy in real estate

Depending on the stage of the building's life, its age, purpose and location, the emission reduction strategy will be slightly different each time. However, implementing a reduction plan always requires going through four stages:

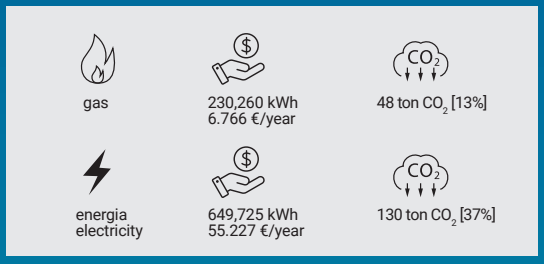
1. Calculation of today's emissions based on measurements and reports
2. Creating optimisation solutions unique for a specific building/portfolio
3. Implementation of the above-mentioned solutions, monitoring/calculation of emission reduction
4. Offset for other reductions that cannot be achieved with operational implementations

CASE STUDY

Examples of utility savings generated for one of our clients in Portugal:

Disaggregation of DHW and heating systems with different operating temperatures

Installation of a photovoltaic power plant



In the Mota-Engil ATIV methodology, the key areas of analysis are:

- Sustainable design: Designing new buildings or modernisation/arrangement changes in existing buildings using energy-saving solutions (e.g. appropriate insulation, use of renewable energy sources: installation of solar panels, heat pumps, geothermal systems, use of recycled materials).
- Energy efficiency: Use of intelligent energy management systems, energy efficiency in heating, ventilation and air conditioning.
- Conscious water management: use of grey water, use of water flow limiters, use of new technologies in production buildings, in particular in the production of food, cosmetics and medicines.
- Using building materials with a low carbon footprint: Choosing materials such as wood, recycled concrete or materials with lower energy consumption from local producers.
- Carbon offset and carbon forest projects: Carbon offset is a mechanism for offsetting CO_2 emissions that are unavoidable or difficult to reduce as part of development/operating activities. An important element of the offset is the use of only certified carbon credits, which guarantee their actual origin. Mota-Engil ATIV is one of the few companies with the Verra certificate – Verified Carbon Standard (VCS), which guarantees the assessment of offset projects and their role in ensuring the transparency and quality of activities towards carbon neutrality. Forests are one of the most effective natural mechanisms for absorbing CO_2 and their proper exploitation supports biodiversity and ecosystem protection, while helping companies achieve carbon neutrality goals.

CASE STUDY

Mota-Engil ATIV is a partner of Baldios da Corvaceira – "Clustered Project for the Reconstruction of Northern and Central Portugal", a project of afforestation, reforestation, and revegetation in line with biodiversity standards.

The main goal is the recultivation of over 85 hectares of degraded land. These efforts will play a key role in mitigating greenhouse gas emissions by sequestering a total of 68,085 tonnes of CO_2 over its 40-year lifespan.

Summary

The real estate industry is at a key moment in its transformation, moving towards sustainable development and striving to reduce CO_2 emissions. The benefits of implementing a carbon footprint reduction strategy are not only environmental, but also competitive. Buildings with high climate neutrality parameters will have a chance to obtain greater transaction value, support from financial institutions in modernisation projects, but will also be cheaper to maintain, which will translate into competitive leasing.

The role of investors and developers in this process is invaluable. Co-operation with partners experienced in implementing comprehensive pro-environmental solutions or new technologies, engaging in green energy projects, or investing in certified carbon credits are the next steps to achieving increasingly higher climate neutrality parameters for buildings and their users. Every organisation using the space under the roof is directly involved in the process of reducing the negative impact of using this space on the environment. ◢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EU Taxonomy in construction – is the investment environmentally sustainable?

The European Union has set an ambitious goal of achieving climate neutrality by 2050 through the "European Green Deal" growth strategy, which leads to a series of actions aimed at defining the directions and supporting the achievement of this goal. One of these actions is the creation of tools and strategies for sustainable financing within the EU, as well as providing incentives to redirect capital flows towards sustainable investments.

EU taxonomy, as it is commonly called Regulation (EU) 2020/852 of the European Parliament and of the Council of 18 June 2020 on the establishment of a framework to facilitate sustainable investment[1)] is a tool for classifying economic activities that can be considered environmentally sustainable. The purpose of its introduction is to enable a clear assessment of the extent to which a given activity is sustainable, to enable preferential treatment and to accelerate financial flows for the implementation of these types of activities.

These activities concern all sectors of the EU economy, including construction, which is one of the leading sectors of the economy in terms of greenhouse gas emissions.

Six environmental goals

The EU taxonomy is closely linked to other EU strategic documents and policies that are related to the ESG reporting obligation. Organisations subject to reporting requirements must disclose how their activities align with the criteria set out in the EU Taxonomy. For businesses not yet subject to these obligations, the Taxonomy can serve as a tool to access sustainable investment financing and the preferential conditions associated with it.

1 Regulation (EU) 2020/852 of the European Parliament and of the Council of 18 June 2020 on the establishment of a framework to facilitate sustainable investment, and amending Regulation (EU) 2019/2088 (Text with EEA relevance) https://eur-lex.europa.eu/legal-content/PL/TXT/?uri=celex%3A32020R0852

Implementing an investment in line with the Taxonomy involves meeting its criteria for environmentally sustainable economic activity. In this context, 6 environmental objectives have been defined against which individual activities are assessed: climate change mitigation, climate change adaptation, the sustainable use and protection of water and marine resources, the transition to a circular economy, pollution prevention and control, and the protection and restoration of biodiversity and ecosystems.

For an economic activity to be recognised as environmentally sustainable, it must make a substantial contribution to at least one of the environmental objectives, while simultaneously not causing significant harm to any of the other objectives — the so-called "Do No Significant Harm" (DNSH) principle. Furthermore, the activity must be conducted in accordance with minimum safeguards and complies with technical screening criteria that have been established.

Taxonomy plus additional acts

An integral element of the EU Taxonomy are the regulations supplementing it, which define the technical screening criteria required to be met – The Climate Delegated Act[2)] and The Environmental Delegated Act[3)]. These regulations specify detailed, for each type of activity, criteria for assessing whether or not a significant contribution is made and whether such activities cause serious harm to all environmental objectives.

If a particular activity is not included in this classification, it does not necessarily mean that it is not sustainable or environmentally friendly. This may be due to the activity having no impact on the environment or because it cannot make a significant contribution to one of the environmental objectives.

Activities in the "construction and real estate activities" sector, as defined in The Climate Delegated Act, include categories of activities for which technical qualification criteria are established, such as:

- construction of new buildings;
- renovation of existing buildings;
- installation, maintenance and repair of energy efficiency equipment;
- installation, maintenance and repair of charging stations for electric vehicles in buildings (and parking spaces attached to buildings);
- installation, maintenance and repair of instruments and devices for measuring, regulation and controlling energy performance of buildings;
- installation, maintenance and repair of renewable energy technologies;
- acquisition and ownership of buildings.

For the above categories of activities, this regulation specifies the criteria for a substantial contribution to climate change mitigation or climate change adaptation and not causing significant harm to any other environmental objective.

The Environmental Delegated Act, for categories of activities related to the construction industry such as:

- construction of new buildings,
- renovation of existing buildings,
- demolition and wrecking of buildings and other structures,
- maintenance of roads and motorways,
- use of concrete in civil engineering,

sets out technical screening criteria for making a substantial contribution to the transition to a circular economy and not causing significant harm to any of the other environmental objectives.

To assess whether a given investment is environmentally sustainable and complies with the Taxonomy criteria, the first step is to correctly classify the project into the appropriate activity category, followed by an analysis of the requirements related to making a sub-

2 Commission Delegated Regulation (EU) 2021/2139 of 4 June 2021 supplementing Regulation (EU) 2020/852 of the European Parliament and of the Council by establishing the technical screening criteria for determining the conditions under which an economic activity qualifies as contributing substantially to climate change mitigation or climate change adaptation and for determining whether that economic activity causes no significant harm to any of the other environmental objectives (Text with EEA relevance) https://eur-lex.europa.eu/legal-content/PL/TXT/?uri=celex:32021R2139

3 Commission Delegated Regulation (EU) 2023/2486 of 27 June 2023 supplementing Regulation (EU) 2020/852 of the European Parliament and of the Council by establishing the technical screening criteria for determining the conditions under which an economic activity qualifies as contributing substantially to the sustainable use and protection of water and marine resources, to the transition to a circular economy, to pollution prevention and control, or to the protection and restoration of biodiversity and ecosystems and for determining whether that economic activity causes no significant harm to any of the other environmental objectives and amending Commission Delegated Regulation (EU) 2021/2178 as regards specific public disclosures for those economic activities. https://eur-lex.europa.eu/legal-content/PL/TXT/?uri=celex%3A32023R2486

stantial contribution to the specific environmental objective and not causing significant harm to the others. For example, when constructing a new building, in order to demonstrate a substantial contribution to the environmental objective "climate change mitigation", the following conditions must be met:

1. The Primary Energy Demand (PED)[4], defining the energy performance of the building resulting from the construction, is at least 10% lower than the threshold set for the nearly zero-energy building (NZEB) requirements in national measures implementing Directive 2010/31/EU of the European Parliament and of the Council[5]. The energy performance is certified using an as built Energy Performance Certificate (EPC).
2. For buildings larger than 5,000 sqm[6], upon completion, the building resulting from the construction undergoes testing for air-tightness and thermal integrity[7], and any deviation in the levels of performance set at the design stage or defects in the building envelope are disclosed to investors and clients. As an alternative; where robust and traceable quality control processes are in place during the construction process this is acceptable as an alternative to thermal integrity testing.
3. For buildings larger than 5,000 sqm[8], the life-cycle of the Global Warming Potential (GWP)[9] of the building resulting from the construction has been calculated for each stage in the life cycle and is disclosed to investors and clients on demand.

At the same time, it is necessary to indicate compliance with the "do no significant harm" principle in relation to other environmental objectives. The requirements defined for each category of activities, related to demonstrating no significant harm to the other environmental objectives, are interrelated and depend on which environmental objective the activity or project makes a significant contribution to. In the example of the "construction of a new building", this involves meeting a series of detailed requirements, such as: conducting an analysis and risk assessment of climate risks and adaptive solutions for climate change, implementing solutions and equipment in the project that reduce water consumption, implementing the project in line with circular economy principles — both by incorporating circular solutions into the design, demonstrating a higher level of resource efficiency, adaptability, flexibility, and potential for disassembly to enable reuse and recycling, as well as ensuring that 70% of the waste generated on the construction site is prepared for reuse or recycling, meeting requirements regarding the content of harmful substances in building components and construction materials used, as well as introducing solutions to reduce noise, dust, and pollution during construction works, construction of the facility in accordance with the conditions set out in the field of protection and restoration of biodiversity and ecosystems.

The above requirements affect both the design of the building and its technical parameters, but also how it will be implemented and how it will operate. This requires proper planning, the engagement of specialists and contractors capable of delivering projects in line with the Taxonomy, and allocating

4 The calculated amount of energy needed to meet the energy demand associated with the typical uses of a building expressed by a numeric indicator of total primary energy use in kWh/sqm per year and based on the relevant national calculation methodology and as displayed on the Energy Performance Certificate (EPC).

5 Directive 2010/31/EU of the European Parliament and of the Council of 19 May 2010 on the energy performance of buildings (OJ L 153, 18.6.2010, p. 13).

6 For residential buildings, the testing is made for a representative set of dwelling/apartment types

7 The testing is carried out in accordance with EN13187 (Thermal Performance of Buildings – Qualitative Detection of Thermal Irregularities in Building Envelopes – Infrared Method) and EN 13829 (Thermal performance of buildings. Determination of air permeability of buildings. Fan pressurisation method) or equivalent standards accepted by the respective building control body where the building is located.

8 For residential buildings, the calculation and disclosure are made for a representative set of dwelling/apartment types.

9 The GWP is communicated as a numeric indicator for each life cycle stage expressed as kgCO2e/sqm (of useful internal floor area) averaged for one year of a reference study period of 50 years. The data selection, scenario definition and calculations are carried out in accordance with EN 15978 (BS EN 15978:2011. Sustainability of construction works. Assessment of environmental performance of buildings. Calculation method). The scope of building elements and technical equipment is as defined in the Level(s) common EU framework for indicator 1.2. Where a national calculation tool exists, or is required for making disclosures or for obtaining building permits, the respective tool may be used to provide the required disclosure. Other calculation tools may be used if they fulfil the minimum criteria laid down by the Level(s) common EU framework (version of 4.6.2021: https://susproc.jrc.ec.europa.eu/product-bureau/product-groups/412/documents), see indicator 1.2 user manual.

appropriate resources for this purpose within the project budget. Currently, the construction industry is preparing to implement investments according to these guidelines, but because these are new regulations, many doubts and questions arise about how these requirements will be practically met. In response to these uncertainties, the Polish Ministry of Development and Technology published a guide in October 2024, prepared by the EU Taxonomy Technical Criteria Interpretation Team for Construction and Real Estate. This document includes frequently asked questions (FAQ) and answers regarding the interpretation of technical qualification criteria[10]. For current information on the EU Taxonomy, answers to frequently asked questions, and requirements for specific categories of activities, the "EU Taxonomy Compass" tool provides access to the detailed requirements for each activity category. This tool is available directly on the official EU Taxonomy Navigator website[11].

Staying up-to-date with changes and new interpretations is particularly important because these regulations — both in terms of the types of activities included in the Taxonomy and the technical qualification criteria — will be gradually expanded, updated, and adjusted in line with changes in climate and environmental policy, the latest scientific evidence, and advancements in technology.

Summary

Today, a big challenge for the industry is to meet the requirements related to sustainable development, but first of all it is very difficult to understand and navigate the complexity of the related requirements and the constant need to update information and knowledge in this area. The EU taxonomy changes the way we look at real estate investments by adding new criteria related to sustainable development that will affect their profitability. These changes impact all participants in the investment process and require a shift in approach in many areas when planning, financing, and implementing investments. The answer to these needs is education, sharing best practices, and exchanging experiences and knowledge among all participants in the process. ◢

10 "Frequently asked questions and answers (FAQ) regarding the interpretation of selected technical qualification criteria of the EU Taxonomy for business activities in the construction and real estate sector", October 24, 2024. Ministry of Development and Technology, https://www.gov.pl/attachment/ab76ee14-6914-4bdd-a1a7-5907200a14e4

11 https://ec.europa.eu/sustainable-finance-taxonomy/

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Support from the Ministry of Development and Technology in the application of EU Taxonomy in Poland

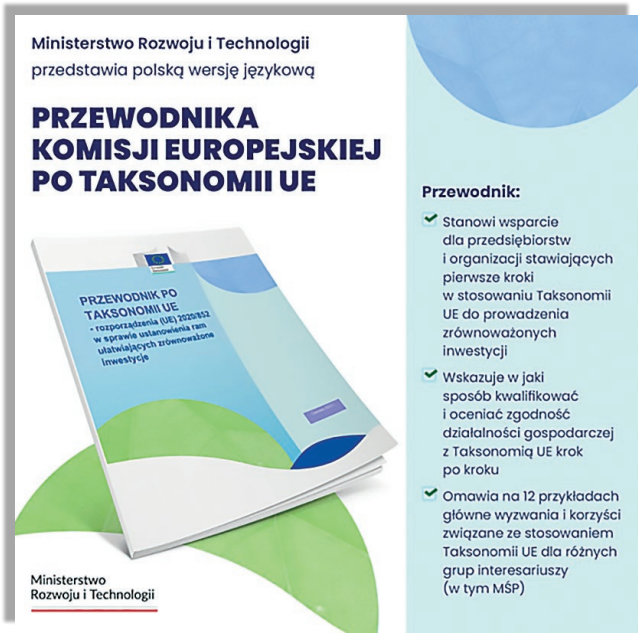
Since May 2023, the Ministry of Development and Technology has led the Working Group for the application of the EU Taxonomy. Within this Group we have managed to create a forum where a wide range of experts collaborate on the EU Taxonomy. Through these activities, we attempt to interpret the sometimes-difficult-to-understand specialist regulations that follow from EU Directive 2020/852 into guidelines and answers for businesses regarding the EU Taxonomy and its requirements.

Within the Group, we particularly concentrate on producing educational materials to support organisations in the Polish market in their application of the EU Taxonomy. We also disseminate knowledge about the work published by the EU's Sustainable Financing Platform and we inform businesses about the current work of the European Commission regarding the Taxonomy.

A European Commission's guide to the EU Taxonomy in Polish

In June 2023, the European Commission published the Guide to support businesses and organisations covered by EU directive 2020/852, to establish a framework to enable sustainable investment, to understand the main challenges and to benefit from its application.

The Guide can act as a support for businesses and organisations with differing levels of familiarity of the EU Taxonomy, including those that are for the first time investing in projects friendly to the climate and the environment. It explains such matters as how to qualify and assess to what extent business activities comply with the EU Taxonomy and with twelve examples, explains the main challenges and advantages of complying with EU Directive 2020/852 for different



groups of stakeholders including small- and medium-sized businesses.

Having received numerous requests from those interested in obtaining a Polish language version of the document, we decided to translate the Guide. The publication was verified by the experts from our Working Group. Due to the need to update some information in the Guide to reflect the current state of legislation, additional information was included in the rules and marked with a comment from the Ministry.

The FAQ for construction and real estate

Till now, the European Commission has provided numerous answers to the most commonly asked questions in regard to the interpretation of particular requirements resulting from the EU Taxonomy. Realising that doubts and uncertainties still exist for certain industries, we have compiled a document of the most frequently asked questions and their answers for particular industries covered by the EU Taxonomy, which may prove useful for declaring information in accordance with Art. 8 of the Directive with regard to the Taxonomy and doing business in Poland.

At the end of October 2024, we accepted the first document with replies to the FAQ concerning the interpretation of the EU Taxonomy criteria for two of the sectors in the Polish economy with the highest emissions: construction and real estate. The document contains information about current practices and suggested solutions. Crucially, it does not set out exclusive solutions and practices that may differ between financial institutions and market participants. The questions were collected with the help of a public internet survey.

The FAQ contains the answers to 52 questions. The questions were organised under 5 topics:

1. general (including the prospects for the financial sector, the relationship between the general contractor and the investor, how to confirm qualifications and compliance of activities);
2. energy efficiency (including both the certification of the energy characteristics of a building and the calculation of its primary energy requirement);
3. building materials and technical solutions (apart from strict material questions, also topics such as air-tightness and heat retention of a building);
4. climate risk (particularly the assessment of physical risks on the basis of Appendix A to annexes I-II of EU Commission delegated regulation 2021/2139 and annexes I-IV of EU Commission delegated regulation 2023/2486);
5. investment and construction (related to the procedural questions of the real estate business).

We continuously monitor whether the document is up to date, which is why it is soon to be reviewed to take into account a new communication from the Ministry of Development and Technology regarding the 15% and 30% thresholds for the most energy efficient buildings constructed before 31 December, 2020, for which energy certification has been issued[1)].

Guide for businesses in applying the minimum EU Taxonomy guarantees

It turns out understanding the technical environmental criteria within the EU Taxonomy for individual businesses, is not the only challenge. Companies also have to take into account the social requirements, otherwise known as the minimum guarantees. Although in 2022, the EU Sustainable Finance Platform issued a report with recommendations in this field, it did not take into account the updated OECD

1 According to the State on 16/12/2024: https://www.gov.pl/web/rozwoj-technologia/Taksonomia-zrownowazonego-finansowania-inwestycji-budynki

guidelines of the Convention of International Labour Organization (ILO) in force since 8 June, 2023, concerning health and safety at work included in the ILO canon of fundamental conventions in 2022 and it does not address the practical aspects of incorporating due diligence practices at the level of a business.

At the end of December 2024 after many months work, we succeeded in finalising the Polish version of the Guide for businesses in regard to applying Art. 18 of the Taxonomy Directive. It can support businesses in applying the OECD guidelines for multinational companies in regard to the responsible running of a business and UN guidelines for businesses in regard to human rights. It acquaints businesses with the requirements of how to run a business responsibly and the actions required together with examples of how they can be applied. It contains case studies, answers to the most frequently asked questions and other useful sources of information.

The Guide consists of five sections:

1. The requirements placed on industry to receive the minimal guarantees based on the EU Taxonomy – how to abide by the guidelines of the OECD and the UN is explained, as well as how to implement required due diligence.
2. Case study. Minimal guarantees in business activities based on the example of Wnętrze marzeń.pl – This section describes how to implement appropriate activities and outlines the challenges with the example of a fictitious company.
3. Examples of diagnostic questions to monitor the effectiveness of activities undertaken to protect human rights – this section is dedicated to the most important question of monitoring the effectiveness of activities to ensure the responsible management of a business including respect for human rights.
4. Information-education – the information presented includes links to educational resources, as well as organisational tools that can be used by businesses to identify violation risks and injustices regarding human rights and other fields related to the responsible management of a business particularly those concerning the supply chain.
5. Frequently Asked Questions (FAQ)

It needs to be emphasised that the document is not a statement of the law but contains numerous examples and valuable guidelines adapted to Polish conditions on how to run a business.

Plans for 2025

This year we have planned a number of activities as part of the Working Group for the application of the EU Taxonomy. We want to compile another FAQ, but this time for the energy and chemical sectors. Until 30 January, 2025, you could ask questions on the interpretation of the regulations for these sectors, which would later be examined by experts[2]. Fur-

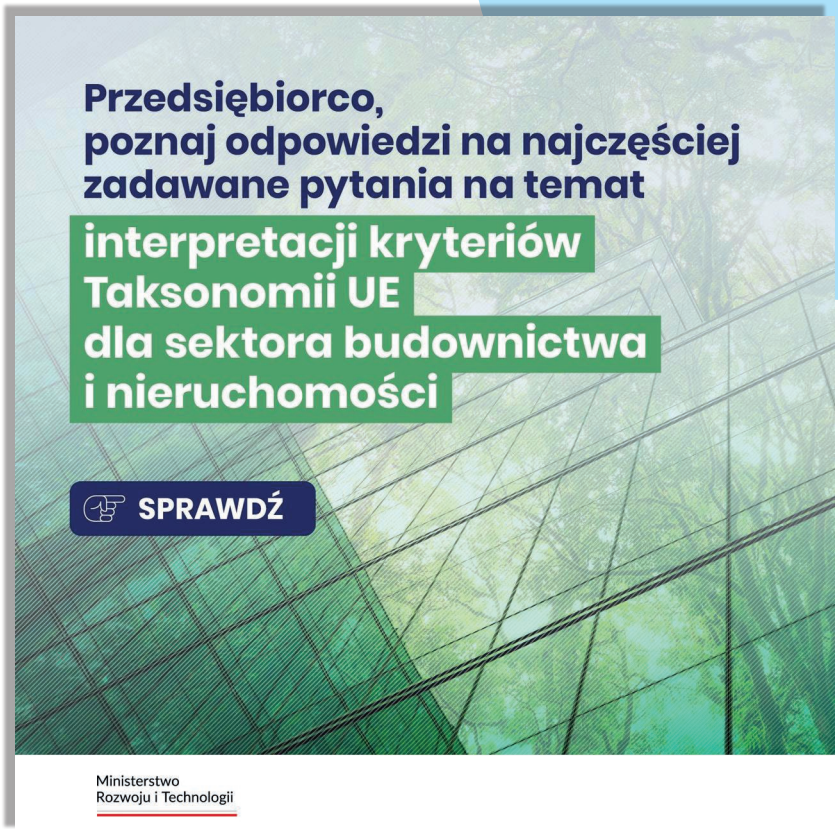
2 https://www.gov.pl/web/rozwoj-technologia/ankieta-mrit--zadaj-pytanie-dotyczace-interpretacji-kryteriow-taksonomii-ue-dla-sektorow-energetycznego-i-chemicznego

thermore, in regard to the minimal guarantees, we are considering the preparation of another topical addition to the Guide to also support SMEs in implementing appropriate activities. We are also planning a compendium of good market practices, which will inspire Polish stakeholders to apply the EU Taxonomy in practice and not just through the mandatory Taxonomy disclosures in sustainable development reports.

We encourage you to look at the progress of our work so far and to monitor the activities of the Working Group on our internet site[3]. ◢

3 https://www.gov.pl/web/rozwoj-technologia/grupa-robocza-ds-stosowania-taksonomii-ue

The guide is not an interpretation of the law, but contains numerous examples and valuable tips relevant to the Polish business context



Maciej Gwiaździński
Head of Energy Strategy & Transformation, Reesco, Iliard

Is Energy Due Diligence the solution you are looking for?

Energy audits under the magnifying glass

Choosing the right energy audit is quite a challenge today. Each of the available audits promises savings and efficiency, but how do you find the one that will actually translate into concrete results? We look at how audits differ and why Energy Due Diligence could be the one that changes the rules of the game.

What is the reality of energy audits in Poland today? You have several options to choose from, each based on an energy foundation, promising different things, focusing on slightly different areas, but what is it really like? How do you compare the pear with the apple? What to choose: de-carbonisation, market–based, or maybe a mandatory audit will suffice, because after all, they touch on the same areas? Seemingly, it's possible, but not really. Imagine that your building is a piggy bank with holes in it. The air is wheezing somewhere, heat is escaping, energy is flying like a light bulb turned on by children, and the bills? Well, they resemble a monthly serving of micro heart attacks.

Every property manager or building owner knows the pain, especially in recent years. And while energy audits promise to help, they often leave us with dry numbers that look more like the results of a math exam than an action plan. Why is this the case? The problem is often a lack of standardisation and the reduction of audits to the minimum required by regulation or market expectation. A mandatory audit is an obvious formality. A market audit shows directions, but quite often leaves you with questions: "Well, what's next? Will I get specifics later? How do I de-

sign it? Does it really cost that much?" Net Zero and ESG audits? Great if you're concerned with green governance requirements, of course, or if you're going to upgrade to a more environmentally friendly building yourself, but again, you'll need extra time, budget, and facilities for the lengthy process. Finally, there's green certification of various sorts, including the flagship BREEAM certification in Poland, at the moment. Prestigious, but at the same time lengthy, requiring a lot of energy on the client's side, including filling out documents, sending proofs, not necessarily having its centre of gravity on the energy result and the savings itself.

Energy Due Diligence – fine tuning your building

We know how the market works today, and you have to ask yourself one question, but a very important one: is this really what I need now, and is this the best we can achieve? What if someone looked at your building not as a statistic, but as a jigsaw puzzle, where every element – from the heating schedule to the efficiency of the machines – can be tuned like a race car engine? That's where Energy Due Diligence (EDD), a next–generation audit that's like a team of top racing engineers, comes in all green: they analyse every detail, design specific improvements and give you an edge over the rest of the pack.

Does this mean that EDD is perfect and for everything? No, because it depends on what you really need – cost reduction, green energy, or maybe an upgrade plan? EDD doesn't shine like the most expensive gadget on the market – it just works if you know what you want to achieve. It goes from assumptions through numbers in the report to strategy, and from strategy to savings. Because who doesn't like to see bills go down and a building start running with the accuracy of a Swiss watch? It's something like a personalised tune–up of your building – detailed, advanced, and with real results, but reasonably timed. So: sit back, let's go with a comparison!

Let's compare EDD with other audits and see why this solution will be a real game changer in the energy world.

1. Mandatory audit – a bit like a technical inspection of a car: because you have to

Imagine that you have to do an inspection of your car, because without it you will not be able to drive it. That's how a mandatory energy audit works – a formal requirement that you must meet in order to tick off the right boxes. The mandatory audit examines energy consumption, shows basic and obvious losses and... most often, that's where it ends. You have "passed", but with real optimisation there may be less than more to do. It's like hearing from a mechanic: "Well, it drives, brakes, and squeaks a little but you still have to drive, listen, and observe". Thank you very much, but what should I do next? It is possible that there will be an awkward silence. But what do you actually get? A table with numbers, even recommendations, but often without a concrete conclusion on how to implement it further and whether it really makes economic sense.

> ***In a world where every penny counts, competitiveness, or every kilowatt hour, EDD is the best thing you can do for your building. It's not a cost – it's an investment that pays off faster than you think***

EDD takes a different approach. It doesn't just tell you what's creaking, but suggests solutions through analysis and measurements: "Measure this more, tweak that, replace that, plus optimise the driving time – and consumption will drop by 12%". Simple, specific and to the point.

2. Market audit – diet from the Internet, seemingly works, but...

A market energy audit goes a step further. An expert comes in, analyses your building, shows you where things can be improved. It's better, sometimes even very good, but you still don't know who you're going to get and what will be in the report. Why? Because the audits themselves don't necessarily have a standardised scope, and solutions can be repetitive or schematic with general recommendations, like a diet from the internet: "eat less, move more". Well great, but how about taking your individual needs into account?

EDD in this comparison is like a premium dietitian dissecting actions over a longer period of time because you won't do everything in a week anyway. He collects data, analyses everything from A to Z and gives specific steps: "Here you have a leak, here the equipment is operating inefficiently, and here by changing the schedule you will save 8% of energy for this particular installation. He'll convert everything for you in terms of dollars, payback time, and specific solutions." It's not just an audit – it's an action plan.

3. Net Zero audit – ambitious and demanding

If your building dreams of achieving energy neutrality, a Net Zero audit is a great tool. It's a goal that's ambitious, environmentally friendly and with a future. Except. Net Zero is like an electric Bentley – prestigious, not necessarily for everyone, and remember that you also need a charger and money to finance it? Or would an efficient car that meets your needs suffice? Not every building can (or should) achieve Net Zero – especially if the costs of such investments are disproportionately high compared to the savings or value of the building itself.

To achieve Net Zero, every building requires huge investments, technology and time, and for some buildings it is economically almost unattainable. Remember that the planned investments need to be recalculated, implemented, and then confront the assumptions with reality... And if from the beginning of the process the audit operated on indicators, the end result may diverge from reality – what then?

EDD does not promise miracles in this case. He shows how to do as much as possible with what you have or with what you want to spend. Can your building be Net Zero? Perhaps. But with EDD you will start with real steps and savings – now, not in 5 years or a decade.

4. ESG and BREEAM – great PR, but is it concrete?

An ESG audit is the basis for an organisation–wide sustainability policy: important and even very important, but at the moment still quite watered down by the lack of some of the implementing regulations at the national level. It looks very cross–cutting in many areas like energy, environment, water, emissions, society and governance, but its energy effects can be treated as one of many. Likewise with BREEAM – you get a prestigious certification, but the process can be so lengthy that instead of counting the savings, you count the hours spent on documentation.

EDD doesn't need PR because it focuses only on energy which ultimately projects ESG and BREEAM certification. Its strength are the results. It doesn't tell you that your windows are "leaky" – it accurately calculates losses, shows solutions, and provides payback time. There's no pouring water, it's concrete.

EDD – that's energy tuning for Formula 1

There's no room for generalities in EDD. You don't have to choose between ecology, savings and sustainability. With EDD you get an all-in-one, tailored to your building. There is a detailed analysis of the building, its processes and schedules including measurements. It's something like a Formula 1 engineering team: they measure every detail, analyse efficiency and fine-tune every element to make the building run at full capacity in the first month, quarter, year.

SUMMARY OF EDD AUDITS

Category	EDD	Energy Audit (mandatory)	Energy Audit (market)	Audyt Net Zero
Legal Requirement	X	●	X	X
Technical Analysis	●	○	○	○
Economic and Energy Analysis	●	○	○	○
Energy Analysis (consumption)	●	●	●	○
CO_2 Emissions Analysis	○	○	○	●
Analysis of other legal energy requirements	○	X	X	X
Energy simulations	●	X	○	○
Calculations	●	○	○	X
Measurements of the building's parameters	●	X	X	X
ESG	○	X	○	○
Precise ROI	●	X	○	X
Climate Analysis	○	X	X	○
E-Transport	○	X	X	X
Comfort and Health	○	X	X	○
Analysis of Contracting Media	●	X	X	X
Analysis of Distribution	●	○	○	X
Analysis of Operations in terms of Energy	●	○	○	X
Analysis of Equipment Consumption in terms of Energy	●	○	○	X
Management - effective processes and maintenance	○	X	○	X
Water – savings, recycling, management efficiency	○	○	○	X
Materials – durability, ecology, recycling of materials	X	X	X	X
Waste Management – minimisation, segregation, recycling	○	X	○	X
Land Development and Ecology – biodiversity, enviromentally-friendly	X	X	X	○
Pollution – emission reduction, environmental protection	○	X	○	○
Resistance to Climate Change – adaptation, resistance to extreme conditions	○	X	X	○

Audyt ESG	Audit for BREEAM certificate v6
○	X
X	X
○	X
○	○
●	●
○	X
X	X
X	X
X	X
○	○
X	X
○	X
●	●
○	●
X	X
X	X
X	X
X	X
●	●
○	●
○	●
○	●
●	●
●	●
●	●

EDD is more than an audit – it's a strategy for success. With it:

- You optimise energy consumption – and in a tailored way.
- You realistically save money – because every action is converted into time and money.
- You gain a competitive advantage – because you don't just look "eco," you actually are and you actually operate efficiently.

In a world where every penny counts, for competitiveness or every kilowatt hour, EDD is the best thing you can do for your building. It's not a cost – it's an investment that pays for itself faster than you think. Because, after all, it's not about "being right," it's about being the best. ◢

● a lot of pressure to include

○ mostly included / less pressure to include

X generally not included

Smart building management aligned with ESG principles

Łukasz Kwieciński
Customer Satisfaction & Property Management Director, Skanska Commercial Development Europe

Brama Miasta, a modern office building developed by Skanska in Łódź, exemplifies the use of innovative building management technologies aligned with the principles of sustainable development. The BMSCare platform plays a key role in this process, providing detailed data on building operations and enabling effective analysis to reduce energy, water, and heat consumption.

In the first half of 2024, electricity consumption per square metre of rented space decreased by 8% compared to the same period of the previous year. Similarly, heat consumption was reduced by 9%, and water usage by as much as 17%

The BMSCare platform offers comprehensive monitoring of building systems, allowing for the identification of irregularities in the operation of devices, sensors, and metres during technical inspections or early usage stages. Its deployment at Brama Miasta enables optimised building automation, ensuring its adaptation to variable conditions inside and outside the office building. This optimisation translates primarily into environmental and financial benefits.

At Brama Miasta, in the first half of 2024, electricity consumption per square metre of rented space decreased by 8% compared to the same period of the previous year. Similarly, heat consumption was reduced by 9%, and water usage by as much as 17%. The introduction of BMSCare also led to a reduction in CO_2 emissions related to ventilation, which in 2024 were twice as low as before the system's implementation. These results underscore the tool's effectiveness in supporting climate goals.

One of BMSCare's innovative features is ESG Mode, which optimises temperatures in office spaces based on weather conditions. This not only reduces energy consumption but also positively impacts the comfort and health of office occupants. Additionally, BMSCare supports ESG and CSRD reporting processes. The data generated by the platform is beneficial for tenants and investors, enabling easy and accurate integration of building performance results into ratings such as GRESB.

Brama Miasta proves that advanced technologies can be a key element of modern building management. The use of BMSCare shows that it is not only about cost reduction but, above all, a step toward a more sustainable future, where energy efficiency goes hand in hand with environmental care.◢

Brama Miasta is over 40,000 sqm of modern office space adjacent to the revitalised part of the New Centre of Łódź

Monika Chacińska
Environmental Manager,
Skanska Commercial
Development Europe

A modern approach to waste management – WasteTracker

WasteTracker, implemented across Skanska's office portfolio in Central and Eastern Europe, is an innovative tool supporting waste management by enabling precise monitoring of individual tenants and building-wide analysis, while also calculating the CO_2 emissions generated. Its sophisticated analytics system collects detailed data on the quantity and types of waste produced, allowing for the effective implementation of carbon footprint reduction strategies.

The tool combines intuitive operation with modern technology, making it both accessible and efficient in everyday use. A key component of the system is a weighing terminal that uses access cards, allowing for the weighing and registration of waste prior to disposal in containers. Tenants receive detailed insights into their waste output and its composition, enabling them to track their carbon footprint. This approach supports not only waste reduction but also improved sorting and reuse.

WasteTracker also serves as an educational platform. By providing clear data, it enables tenants to organise training sessions and awareness campaigns that promote best practices in waste reduction, segregation, and circular economy principles. The system adapts to the specific needs of each building, highlighting areas requiring improvement. For example, buildings producing large volumes of mixed waste can focus on improving segregation, while others may concentrate on reducing organic waste.

Thus, WasteTracker responds to increasing environmental protection requirements and regulatory pressure. It enables efficient reporting in line with the Corporate Sustainability Reporting Directive (CSRD), which is essential for companies striving for transparency and meeting stakeholder expectations. Accurate waste data is not only an environmental asset but also a vital part of a comprehensive business strategy.

The WasteTracker system will be deployed in seven Skanska buildings across Central and Eastern Europe: Wave in Gdańsk, Brama Miasta in Łódź, phase 2 of Centrum Południe in Wrocław, and Studio B and P180 in Warsaw. It will also benefit tenants at the Port7 project in the Czech Republic and the first building of the Equilibrium development in Bucharest.

Towards zero waste

Our collaboration with WasteTracker is just one of the initiatives through which Skanska contributes to building a circular economy. In constructing our office buildings, we use materials that include recycled content, such as steel, concrete, and aluminum. When preparing future projects, we also apply innovative technologies that allow us to recover as many components as possible from existing buildings. ◢

Information on the volume of waste generated and its separation into types allows the generated carbon footprint to be tracked

Financing the green transformation with EU funds

Emilia Łukaszczyk
Finance and Debt Servicing Specialist, The National Energy Conservation Agency

How can funds from the EU budget be used to finance the green transformation? What are the main areas of support and what are the challenges that can arise in applying for these funds? Let's look for the answers in an understanding of the EU's financing mechanisms, which are crucial for the effective use of the funds available.

In the face of the rising challenges resulting from the so-called triple planetary crisis, the importance of the green transformation continues to rise in modern-day public debates. The European Green Deal forms the basis of activities to further the green transformation, being a comprehensive political strategy for the European Union aimed at achieving climate neutrality by 2050. The EU's budget is one of the crucial tools to pursue such ambitious climate targets.

Financing mechanisms of the Green Transformation in the EU

The EU budget can be divided into two distribution streams:

1. European funds distributed by the European Commission, such as:
   - LIFE
   - Horizon Europe
   - Connecting Europe Facility
   - CInvestEU
2. European funds disbursed in Poland which are divided into:
   - Funds that are part of the European Cohesion Policy:
     - The European Fund for Regional Development (EFRD)
     - The European Social Fund Plus (ESF+)
     - The Cohesion Fund (CF)
     - The European Maritime, Fisheries and Aquaculture Fund (EMFAF)
     - The Just Transition Fund (JTF)
   - Funds that are part of the Recovery & Resilience Facility (RRF):
     - National Recovery and Resilience Plan (NRRP)

Funds related to the EU's Emissions Trading System (ETS) can also be mentioned as a source of financing for energy transformation resulting from EU policy, which are redistributed in Poland through the Modernisation Fund. This article will concentrate on European funds for businesses distributed on the national and regional level in Poland. We shall take a closer look at specific funds such as the Cohesion Fund and the Recovery & Resilience Facility, which support the development of ecological project, as well as innovation in industry.

Cohesion Policy Funds as a key financial instrument of the EU

The Cohesion Policy, which is the main investment policy of the EU, attempts to eradicate economic differences in areas as well as social differences between the EU's separate regions. In accordance with the Partnership Agreement for the 2021-2027 period, funds for goal 2 'A more environmentally-friendly low emission Europe' are to come from The European Cohesion Fund, the European Regional Development Fund and the European Fund for Maritime, Fisheries and Aquaculture in order to pursue the following programmes:

- European Funds for Infrastructure, Climate and the Environment,
- European Funds for Eastern Poland,
- European Funds for a New Economy,
- European Funds for Fisheries,
- 16 regional programmes[1)].

Similar to the previous perspective (2014-2020) around 60% of the funds from the Cohesion Policy will go towards programmes on a national scale and 40% towards regional programmes. The Cohesion Fund is a key financial instrument of the European Union and is one of the most important tools for financing green projects having for many years played an important role in achieving the EU's regional development and ecology goals. The Cohesion Fund is directed to member countries whose Gross National Income per inhabitant is less than 90% of the EU average. Over the 2021-2027 period, 15 countries used the fund, including Poland as the poorest beneficiary.

The European Funds for Infrastructure, Climate and the Environment (EFICE) are some of the most important operational programmes at the central level in regard to the Green Transformation replacing the Operational Programme for Infrastructure and the Environment that were well known from the previous perspective. With regard to the Green Transformation of Industry, 2 priorities are of particular importance:

- The FENX.01 priority, supports the energy and environment sectors from the Cohesion Fund,
- The FENX.02 priority, supports the energy and environment sectors from the ERDF.

The European Funds for a Modern Economy programme 2021-2027 (EFME) is a continuation of two previous programmes: Innovative Economy 2007-2013 and Intelligent Development 2014-2020. As part of Priority 3, the greening of industry projects are supported that directly further the goals of the European Green Deal, including climate neutrality, the green economic transformation, and sustainable development. The most popular finance offered by EFME among businesses is the Ecological Credit, which supports business with investing in energy efficiency. Other forms of support are offered by EFME including the Ekomax credit guarantee distributed from the EFME Green Guarantee Fund. The Ekomax Guarantee is disbursed in the form of de minimis aid or regional investment aid.

Each of the 16 regions encompassed by the European Regions Fund, has its own programme to fund internal investments. Funds were distributed for the 2021-2027 programme on the basis of an algorithm that accounted for objective regional criteria such as population size and GDP per head. Each of the 16 programmes is based on the regional development strategy of the particular region. The European Regions Fund includes projects to reduce greenhouse gases, increase renewable energy generation, adapt facilities to climate change, and preserve nature and biodiversity.

Budgets are made up of funds from the EFRD, the ESF+ and also – for some regions – from the Just Transition Fund (JTF). Over the 2021-2027 period, five regions (Silesia, Małopolska, Wielkopolska, Lower Silesia and Łódzkie) used funds from the JTF in their budgets. This is a new instrument within the Cohesion Policy intended to facilitate the goals of the Green New Deal. These funds will be used within regional programmes that are intended to support the transformation of those regional economies most affected by the change to a low-emission economy. Support from the Just Transition Fund covers regions and sectors dependent on mining fossil fuels.

The Programme for Eastern Poland is a continuation of the Eastern Poland Programme 2014-2020 and covers six regions: Lubelskie, Podkarpackie, Podlaskie, Świętokrzyskie, Warmińsko-Mazuria and also, which is a novelty for the 2021-2027 perspective, Mazowieckie (with the exclusion of Warsaw and 9 surrounding districts). The beneficiaries of the programme are small and medium-sized businesses that operate in Eastern Poland. The funds within the second priority – Energy and Climate, are intended to support the use of scattered renewable energy sources and increase the use of green energy.

1 Partnership Agreement for 2021-2027, pg. 40

Modernisation Fund

The Modernisation Fund (MF) is an initiative of the European Union, which aims to support 13 member states, including Poland, to achieve its energy goals. The funds of the MF come from 4.5% of the sales of CO_2 emission rights traded as part of the EU-ETS. MF is intended to finance:

- priority investments – within at least one field as defined by the ETS Directive Art. 10 d.2 (70% of MF funds)
- non-priority investments – which do not fall under priority fields but fulfil the goals of the MF and reduce greenhouse gas emissions (30% of MF funds).

The total funds available in the Modernisation Fund will depend on the pricing of emission rights. The national operator of the Modernisation Fund is the National Fund for the Protection of the Environment and the Maritime Economy. Currently the NFPEME mainly serves businesses with the legal right to installations covered by the greenhouse gas emission trading system and to power generation companies.

SELECTED CALL FOR ENERGY EFFICIENT AND RENEWABLE ENERGY AS OF 20/10/2024

Call	Field	Timeline
FEnIKS FENX.01.01 Improving the energy efficiency of medium-sized businesses	Improving energy efficiency (including renewable energy installations) in medium-sized businesses.	23.08.2024 – 12.12.2024
FEnIKS FENX. 02.02 Construction, reconstruction, modernisation and extension of renewable energy sources	Construction/ reconstruction/ modernisation/ expansion of renewable energy sources for the production of bio-methane with connection to the gas grid and for the construction or expansion of renewable energy sources for the production of electricity and/or heat from biogas, with energy storage, connection to the grid and infrastructure for the use of heat in co-generation.	23.08.2024 – 12.12.2024
FENG green credit 3rd call	Thermal modernisation of existing buildings, infrastructure modernisation including fundamental changes to manufacturing, investing in renewable energy, small and medium-sized business (small mid-cap, mid-cap).	17.10. 2024 – 31.01.2025
European Fund for a Green Łódź FELD.02.05 Renewable Energy Sources	Infrastructure support for the generation of electricity, warmth and cooling from renewable energy sources, and connection to the grid for such a source.	April 2025 – June 2025 (planned call)

The green transformation is the prime goal of the National Reconstruction Plan

The National Reconstruction Plan (NRP) sets out ambitious goals that are not only intended to reconstruct the economy after the COVID-19 crisis, but also to transform it to be more sustainable and ecological. The National Reconstruction Plan is jointly financed by the Recovery & Resilience Facility (RRF) which forms part of the wider Next Generation EU packet. Blocking the disbursement of NRP funds considerably shortened the period during which the funds could be used, hence the especially short time horizon for the NRP. Commitments (which are understood to be signed financing contracts) will be accepted no later than 30/06/2026.

Selected sources of financing the green transformation of industry in Poland

A so-called 'demarcation line' can be helpful in identifying the appropriate source of funding. The demarcation line serves to coordinate between national and regional levels, while preventing double financing of the same projects from different cohesion policy programmes. Under the 2021-2027 demarcation line, in most cases, small and medium-sized enterprises (SMEs) and smaller installations and projects will primarily be supported at a regional level, while large enterprises and larger projects will mainly benefit from national funding[2)].

2 https://funduszeue.lubelskie.pl/media/zpr/rys_rozne/linia-demarkacyjna/

Allocation	Institution accepting applications	Type of support
From FS: PLN 86,000,000 From national funds – the National Fund for Environmental Protection and Water Management: PLN 15,176,471	The National Fund for Environmental Protection and Water Management	Preferential loans from coherence funds herein known as IF loans and loans offered at market rates from the NFEPWM*.
From the ERDF: PLN 1,512,952,000 From national funds of the NFEPWM: PLN 385,119,000	The National Fund for Environmental Protection and Water Management	Subsidies from ERDF funds, preferential loans from the ERDF loans from the national funds of NFEPWM**.
PLN 660,000,000	Bank Gospodarstwa Krajowego (BGK)	Ecological premiums – subsidies that are a refund of a part of the ecological capital credit.
PLN 71,000,000	The Martial's Office for the Łódź region	Subsidies (according to the detailed priorities description).

* It is mandatory to finance a business with an IF coherence fund loan and loans from the NFEPWM covering 100% of the eligible costs. Project finance projects and businesses for which the final recipients of the support are energy consumers are exempt.
** It is mandatory to finance a business with an IF EFRD and NFEPWM loans that cover 100% of the eligible costs. The exception is project finance businesses.

Key points for projects with EU funding

The Partnership Agreement for 2021-2027 places the responsibility on the recipients to follow some key horizon principles:

- Equality between men and women,
- Equality of opportunity and non discrimination of those with disabilities,
- Sustainable development,
- Following the principle of DNSH (Do Not Significant Harm).

It is also important to follow the Charter of Fundamental Rights (CFR) of the European Union and the Convention on the Rights of Persons with Disabilities. DNSH is a new principle of the current financial perspective, which creates the responsibility that no activities with EU financing may have a negative effect on the natural environment or deepen the climate crisis.

In accordance with the 2021-2027 financial perspective, repayable instruments (mainly comprising preferential loans) will become a key tool in financing low risk projects[1]. Due to this, financing in the form of ESCOs (Energy Service Company) and EPC (Energy Performance Contracting) will become more significant in projects financed by the EU, which will often be reflected in the criteria for point assessment of these projects. Projects that ensure the lowest ecological impact in relation to the resources used will receive clear preference in their support.

The optimal financing of activities in this field is essential in order to gain the maximum ecological benefit. For projects financed with EU funds aimed at improving energy efficiency and reducing greenhouse gas emissions, a fundamental requirement is to achieve a 30% saving primarily of energy usage and in the case of buildings, this should be confirmed with an energy audit. Gas installations shall only be used when connection to the grid and renewable energy sources are not technically viable (in accordance with the hierarchy of heat sources)[2]. Additional investments that support the goals of the Coherence Policy may be a substantial part of a project and the condition that they do not exceed 15% of the total budget.

Conclusion

Only through appropriate financing can we achieve our intended climate goals, Further investment in green transformation, based on solid financial fundamentals will be key to a sustainable future and a competitive economy. By diversifying sources of financial investment, risks can be better hedged and flexibility increased when developing ecologically-friendly projects, which is essential with rapidly changing market conditions. The range of possibilities is wide, but to effectively use these funds it is necessary to overcome numerous challenges such as the complexity of the application procedure. The ultimate success of the green transformation depends on the ability of member states to use EU funds in a way that brings real benefit to communities and the environment. ◢

1 https://ec.europa.eu/regional_policy/funding/financial-instruments_en

2 Partnership Agreement 2021-2027, pg. 24

By diversifying sources of financial investment, risks can be better hedged and flexibility increased when developing ecologically-friendly projects, which is essential with rapidly changing market conditions

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European regulations as the basis for ESG assessment for real estate

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The Polish Chamber of Commercial Real Estate (PINK) at the turn of 2022 and 2023 initiated activities aimed at unifying ESG standards taken into account when making financing and investment decisions in the real estate sector. As part of the work, the "Green Financing" Working Group was established, bringing together PINK members and representatives of several banks operating in Poland and abroad. Participants held a series of meetings aimed at exchanging experiences in assessing real estate sustainability, determining the current status of considering ESG aspects in investment decisions, and defining further steps towards standardising ESG assessment criteria for real estate evaluations. A summary of the Working Group's activities carried out in 2023 was presented in the chapter "ESG Criteria: new challenges for banks and requirements for the real estate sector." in the publication jointly issued with the Polish Chamber of Commercial Real Estate and the Polish Council of Shopping Centers – "ESG for Commercial Real Estate"[1)].

1 https://stowarzyszeniepink.org.pl/wp-content/uploads/2024/04/ESG-2023_ENG.pdf

The main finding resulting from the activities of the Working Group is that banks are aware of the growing importance of ESG aspects in making financial decisions. Analysing the current situation among financial institutions, it can be stated that a single standard for real estate assessment has not yet been developed. Currently, banks are in the process of creating or refining internal ESG criteria for investment assessment. The banking sector points to regulatory authorities and the European Union as their main sources of guidelines for unifying ESG criteria. Compliance with the European Taxonomy has been indicated as an important aspect during investment assessment alongside verification of other real estate features. According to the findings, the case of a positive financing decision, the above mentioned criteria will be disclosed as part of sustainable reporting obligations.

Work on unifying ESG assessments

In the first half of 2024, as part of the Working Group's efforts, actions were taken to collect and summarise ESG criteria resulting from European regulations directly

related to real estate assessment. Three standards were adopted as the basis for determining the criteria:

- EU Taxonomy – the EU classification system established by Regulation (EU) 2020/852 of the European Parliament and of the Council of 18 June 2020 on the establishment of a framework to facilitate sustainable investment[2].
- Sustainable Finance Disclosure Regulation (SFDR) – Regulation (EU) 2019/2088 of the European Parliament and of the Council of 27 November 2019 establishing a reporting system covering financial market participants, aimed at unifying and increasing transparency in the disclosure of information regarding the sustainability of investments[3].
- Corporate Sustainability Reporting Directive (CSRD) – Directive (EU) 2022/2464 of the European Parliament and of the Council of 14 December, 2022 on corporate sustainability reporting to increase transparency in sustainable development reporting.[4]

The guidelines resulting from the above standards, as relating to real estate, have been systematised and compiled into the table below to introduce greater transparency (Sections 1 and 2). The table has been further expanded to include criteria that appeared most frequently during the ESG assessment of buildings, based on the previous experiences of the working group participants (Sections 3 and 4).

Application of presented ESG criteria

The purpose of presenting the criteria is to support market participants in preparing for an ESG assessment, as well as to facilitate the acquisition of data by financial institutions to enable an initial sustainability assessment of investments.

The table presented below should be considered as a set of good practices and a summary of criteria that can be used as a supporting tool for the ESG assessment of properties. It should be borne in mind that demonstrating compliance with the criteria presented below does not guarantee a positive ESG assessment when banks evaluate a given investment.

2 https://eur-lex.europa.eu/legal-content/PL/TXT/?uri=CELEX%3A32020R0852

3 https://eur-lex.europa.eu/legal-content/PL/ALL/?uri=CELEX%3A32019R2088

4 https://eur-lex.europa.eu/legal-content/PL/TXT/?uri=CELEX%3A32022L2464

When applying for investment financing, the internal requirements of a given bank should always be considered as overriding, and may differ from the approach presented in the table below.

Proposed approach to ESG real estate assessment

The table presented below gathers the proposed criteria for assessing real estate in terms of ESG and divides them into 4 sections:

Section 1: Criteria Resulting from the EU Taxonomy

This section contains an outline of the criteria resulting from the requirements of the European Taxonomy. The table has been adapted to assess three types of activities: "Construction of new buildings," "Renovation of existing buildings," and "Acquisition and ownership of buildings." The table does not include detailed requirements contained in the Taxonomy. The guidelines resulting from the European Taxonomy defined for the relevant activity should be taken from source documents (including Commission Delegated Regulations (EU) 2021/2139 and 2023/2486). This section should be treated as a summary of information enabling compliance with the European Taxonomy.

Section 2: Criteria Resulting from the Sustainable Finance Disclosure Regulation (SFDR) and Corporate Sustainability Reporting Directive (CSRD)

This section contains real estate related criteria which have been identified as the main factors having a negative impact on the environment (Principal Adverse Impact – PAI). These are part of the Regulatory Technical Standards (RTS) defining the disclosure methodology under the Sustainable Finance Disclosure Regulation (SFDR). The table also includes greenhouse gas emission indicators resulting from the Greenhouse Gas Protocol, which forms the basis for carbon footprint reporting under the Corporate Sustainability Reporting Directive (CSRD).

Section 3: Additional criteria

This section includes additional criteria not directly resulting from European regulations. The criteria listed in the table have been identified as frequently occurring in existing ESG questionnaires used for

real estate assessment during real estate transaction processes or questionnaires used for verification as part of financing decisions.

Section 4: Criteria in the Social & Governance Areas

Similar to the "Additional Criteria" section of the table, this section includes criteria according to which real estate is verified in the social and governance areas of the ESG formula. Due to significant discrepancies in the approach to assessing social and governance aspects by different market participants and the lack of a unified methodology resulting from European regulations, it is recommended that this section be treated as indicative.

The table is divided into the following columns:

- Criterion – This column contains descriptions of the criteria recommended for use during a real estate assessment.
- Status/Response – This column is intended for entering clear answers, values, or data regarding the status of meeting the criterion.
- Comment – In this column, comments and explanations describing how the criterion is met should be included.
- Supporting Evidence – This column is intended for entering information about documents and other evidence confirming the declared status of the criterion.

ESG CRITERIA FOR REAL ESTATE

Section 1: Criteria Resulting from the EU Taxonomy			
Criterion	Status/Response (fulfilled/not fulfilled/ not applicable)	Comment	Supporting Evidence (document name/chapter/ paragraph)
Name of the Technical Screening Criteria for the Activity (Provide the name of the technical screening criteria according to which the activity is assessed)			
Minimum safeguards (Confirm the compliance of the activity with minimum safeguards)			
The activity makes a substantial contribution to achieving at least one climate objective			
• Climate change mitigation			
• Climate change adaptation			
• Transition to a circular economy			
The activity Does No Significant Harm (DNSH) to other climate objectives			
• Climate change mitigation			
• Climate change adaptation			
• Sustainable use and protection of water and marine resources			
• Transition to a circular economy			
• Pollution prevention and control			
• Protection and restoration of biodiversity and ecosystems			
Compliance with European Taxonomy		Yes/ No	

Section 2: Criteria Resulting from the Sustainable Finance Disclosure Regulation (SFDR) and Corporate Sustainability Reporting Directive (CSRD)			
Criterion	Status/Response	Comment	Supporting Evidence (document name/chapter/ paragraph)
Is the property dedicated to extraction, storage, transport or manufacture of fossil fuels?	Yes/No		
Energy efficiency of property			
• Energy Performance Certificate – Primary Energy (PE) indicator for the property	[kWh/(sqm · year)]		
• Energy Performance Certificate – Primary Energy (PE) indicator required for a new building according to technical and construction regulations	[kWh/(sqm · year)]		
• Date of submission of the building permit application			
Greenhouse gas emissions			
• Scope 1 – direct emissions	[kgCO_2/year] [kgCO_2/(sqm · year)]		
• Scope 2 – indirect emissions	[kgCO_2/year] [kgCO_2/(sqm · year)]		
Energy consumption			
• Energy consumption – Type 1	[MWh/year] [MWh /(sqm · year)]		
• Energy consumption – Type 2	[MWh/year] [MWh /(sqm · year)]		
• Energy consumption – Type 3	[MWh/year] [MWh /(m^2*rok)]		
• Production of energy from a renewable energy source located on the property – Type 1	[MWh/year] [MWh /(sqm · year)]		
• Production of energy from a renewable energy source located on the property – Type 2	[MWh/year] [MWh /(sqm · year)]		
Reporting period for the presented greenhouse gas emissions and utility consumption (12 months)	dd/mm/yyyy – dd/mm/yyyy		

Section 2 continued			
Average share of vacant space in the reporting period	%		
Is the building equipped with facilities for waste sorting or covered by a waste recovery or recycling contract	Yes/No		
Share of raw building materials (excluding recovered, recycled and bio sourced) compared to the total weight of building materials (applies to newly constructed and renovated buildings)	Mass of "raw" building materials: [T] Total mass of building materials: [T] Share of "raw" building materials: %		
Share of non-vegetated surface area (surfaces that have not been vegetated in ground, as well as on roofs, terraces and walls) compared to the total surface area of the plot	Non-vegetated area: [sqm] Total plot area: [sqm] Share of non-vegetated area: %		

Section 3: Additional criteria			
Criterion	Status/Response	Comment	Supporting Evidence (document name/chapter/ paragraph)
Green certification (eg. BREEAM, LEED)	Certificate name: Obtained score: Expiry date:		
Carbon Risk Real Estate Monitor (CRREM) score	Building type: Calculation method: location based / market based Year of stranding: Reporting period: dd/mm/yyyy – dd/mm/yyyy		
ESG CAPEX – planned expenditures during the financing period that have a positive impact on any of the indicators listed in this document	Item 1: PLN/EUR Item 2: PLN/EUR Item 3: PLN/EUR Total: PLN/EUR		

Section 4: Criteria in the Social & Governance Areas			
Criterion	Status/Response	Comment	Supporting Evidence (document name/chapter/ paragraph)
(S) Access to public transportation	Distance from transport means 1 – [m] Distance from transport means 2 – [m]		
(S) Access to alternative means of transport	Electric vehicle charging stations – pcs Facilities for cyclists: Other solutions:		
(S) Facilities for people with disabilities	Certificate confirming building accessibility: Yes/No Facility 1: Facility 2:		
(G) Have "green" leases been signed with tenants?	Yes/No % of rental area covered by "green" lease agreements		
(G) Monitoring and reporting of utility consumption data in the building	Data for the entire building: Yes/No Data for leased areas: Yes/No Additional solutions for monitoring utility consumption:		
(G) Has a sustainability plan been developed for the building and CO_2 emission reduction targets set for the coming years?	Yes/No		
(G) Is the sustainable development plan communicated externally?	Yes/No		
(G) Is there an ESG manager or ESG team assigned to the building?	Yes/No		

Summary

Currently, there is no unified approach in Poland to assess properties in terms of ESG. The banking sector is in the process of creating or refining internal verification lists. The criteria presented in this article should be treated as a set of best practices that can be used by property owners or developers to prepare properties for ESG assessment. The list provided can also be used by banks and investment funds when creating internal questionnaires for conducting ESG assessments of properties subject to financing or purchase.

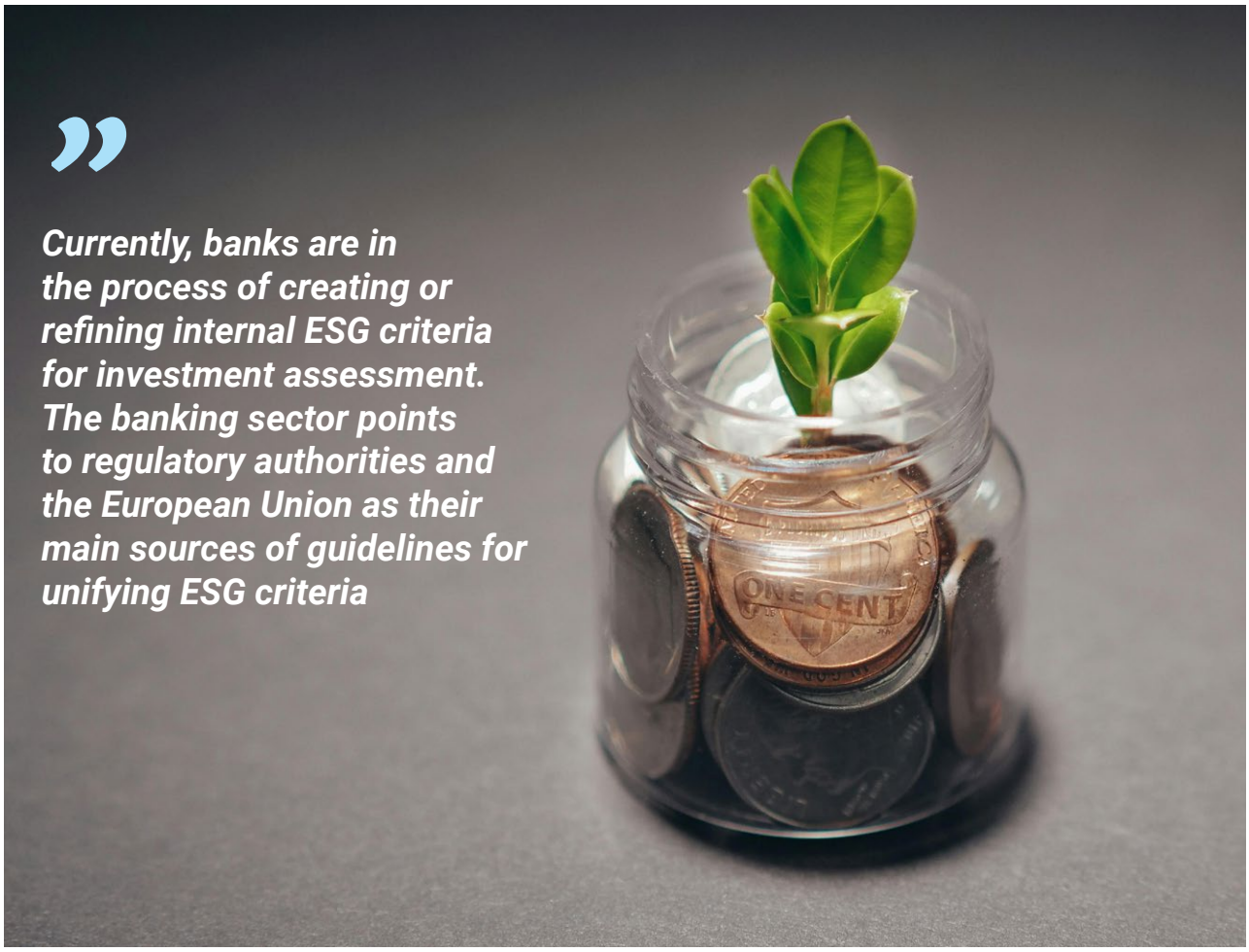
It should be noted that the approach presented in this article is a set of guidelines derived from Eu-

ropean regulations (Sections 1 and 2), and from market practice (Sections 3 and 4). However, meeting these criteria does not guarantee a positive ESG assessment of the investment when applying for financing or in real estate purchase-sale transactions. In such cases, it is necessary to refer to the internal ESG criteria specified by the financing institution.

Currently regulatory and guidance changes in ESG are highly dynamic. The authors have made every effort to ensure that the criteria presented are up to date as of the date of publication of this article. However, they should be treated as indicative and verified in source documents before implementation.

Acknowledgements

We would like to thank the experts gathered in the Working Group 'Green Finance' set up by the Polish Chamber of Commercial Real Estate (PINK), in particular the representatives of the banking sector, for their valuable input and for sharing their experience, including: Aareal Bank AG, Bank Millennium S.A., Bank Pekao S.A., Bank Gospodarstwa Krajowego, Berlin Hyp AG, BNP Paribas Bank Polska S.A., Deutsche Pfandbriefbank AG, PKO Bank Polski, Santander Bank Polska S.A. as well as the following industry associations: Polska Izba Nieruchomości Komercyjnych (PINK), Sustainable Investment Forum Poland (POLSIF), Polska Rada Centrów Handlowych (PRCH). ◢



ESG in property valuation

In recent years, ESG (Environmental, Social, Governance) factors have become increasingly important in various areas of the real estate market, including the real estate valuation process. The evolving regulatory requirements, the dynamic development of international standards, and the growing public awareness of environmental and social responsibility make real estate valuation taking ESG aspects into account not only desirable, but also necessary. In Poland, as in other EU member states, tools and practices are being developed to better understand the impact of ESG factors on property value.

The collection of articles presented in this publication is the result of the work of a team of experts from the real estate industry and real estate valuation professionals, who have carefully examined the key issues related to ESG in property valuation. Their comments shed light on the current development of the inclusion of ESG aspects in the valuation process and highlight the challenges and opportunities.

Despite the challenges of implementing ESG principles in property valuation, the market is gradually adapting to the new realities. The emerging standards and guidelines, supported by evolving market practices will become of pivotal importance in the coming years.

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Impact of the IVSC's ESG standards on the property valuation process

In September 2024, the International Valuation Standards Council (IVSC) published a document[1)] entitled: 'ESG & Real Asset Valuation: Sharpening the Focus, Not Reinventing the Wheel', introducing a proposal for the consideration of ESG factors in property valuation. The document was developed by the IVSC's Tangible Assets Board (TAB) and responds to the changes to the International Valuation Standards (IVS) that came into force on 31 January, 2025, incorporating new references to ESG, included in IVS 104 'Data and Inputs'.

According to IVS 104, ESG factors should be included in the valuation if they are measurable and considered relevant according to the professional judgment of the valuer. This requires an in-depth knowledge of the asset class and the markets in which they operate, as the relevance of ESG factors may vary by property type and local market.

Valuers' understanding of the market-based ESG factors is important to ensure expert and competent valuation advice. To assist in this process in June 2023 the International Sustainability Standards Board (ISSB[2)]) published its first sustainability disclosure standards:

- International Financial Reporting Standards (IFRS) S1 General requirements for financial disclosures related to sustainability;
- IFRS S2 Climate-related disclosures.

The scope of IFRS S2 addresses (a) the climate change risks to which an entity is exposed, i.e. physical risks and transition risks, and (b) climate change opportunities.

ESG as a key element of valuation

IVS require valuers to take into account the relevant ESG factors, as long as they are measurable and consistent with the valuer's professional judgement. It should be noted that IVS may show ESG defining factors relevant to a property type in one market greater and in other markets lesser significance. While some data will be easily accessible, others may require analysis, including the use of external specialists. It is therefore crucial for valuers to be able to use available data, including external sources such as analyses and studies carried out by sustainability and ESG specialists, to provide reliable valuations that take these issues into account.

1 'Perspectives Papers' are publications produced by the International Valuation Standards Council (IVSC) to address relevant topics and emerging trends. Their main purpose is to stimulate discussion, provide valuers with valuable analysis and promote the consistent application of International Valuation Standards (IVS). These publications, while not replacing IVS, are complementary, helping valuers to better understand the challenges and opportunities of evolving valuation practices, such as the integration of ESG factors in property valuations.

2 The ISBB is an independent private sector body that develops and approves International Financial Reporting Standards

ESG include environmental, social, and governance aspects that can affect the value of a property as well as risks and opportunities that are associated with them. New regulations, such as the EU Taxonomy or IFRS on sustainability-related disclosures, are intensifying the pressure to integrate ESG in valuations.

Sections A10.03, A10.04, and A10.05 of Appendix IVS 104 Data and Inputs, provide examples of how valuers can consider environmental, social and governance factors. They are not exhaustive, but are intended to encourage valuers to consider how these factors may affect property valuation.

EXAMPLES OF QUESTIONS IN THE PROPERTY VALUATION PROCESS

E	– How does the property contribute to air, water, land, or other pollution? – Will the property be vulnerable to natural disasters? – How do the characteristics of the property affect resource scarcity, consumption, or efficiency (e.g. energy, water, raw materials)? – Is the property constructed of recyclable materials? – Does the property have adequate waste management plans/policies/procedures? – Does the property require capital expenditure to comply with new regulations and standards?
S	– Is the property close to adequate public services and community facilities? – Does the property have access to a large labour pool? – Is the property located in an area where there is demand for the services / type of space it offers? – How is the property perceived by the local community? – Does the property adequately safeguard the data protection and privacy of its users? – How does the property protect the health and safety of users?
G	– How is the property perceived by market participants? – What are the prospects for financing the property? – Are buyers/tenants willing to pay a premium (or require a discount) to buy/rent the property? – Does the property have a history of adequate operation and maintenance? – Does the property meet or exceed required operational and safety standards? – Are there regulatory restrictions on the use of the property? – Will technological advances affect the immediate future of the property? – Is there a higher and better use of the property?

Some of the questions presented relate to more than one category E, S or G and this is natural. Equally, a large number of them were and are already present in the valuation practice both in the description of the technical and legal condition or the condition of the surroundings and the analysis of the property's potential. The assessment of ESG characteristics of a property is simply an extension of the existing survey and comparative assessment. At the same time, also some of them are difficult to obtain, largely subjective and difficult to measure, which poses a challenge. The IVS document points out that a common misconception is that valuers need to value each ESG factor separately. In reality, it is sufficient to consider factors that are relevant to the market and measurable in accordance with the existing valuation methods.

ESG-informed valuation approaches

Key steps for incorporating ESG aspects into a property valuation include:

- Identifying relevant ESG factors – having a measurable positive or negative impact on value, present or future.
- Focusing on the important issues – the valuer analysing the market takes into account only those aspects that are relevant to market participants.
- Use of relevant data – the availability of reliable information to measure relevant ESG factors is key.

The inclusion of ESG factors in a property valuation can take different forms, depending on the valuation approach used. In a comparative approach, valuers should adapt their analysis to evolving market requirements. Even if current valuations already meet the ESG requirements to include differences in ESG parameters between comparable properties and the valued property, valuers should adapt their analyses to evolving market requirements in this regard.

In an income valuation approach, there are several areas where a valuer should consider ESG factors. In a valuation based on the application of the discounted cash flow (DCF) approach, these will be income, operating costs, capital expenditure, the forecast period and also the risk of additional charges being imposed on the property in the near future related to non-compliance with new regulations and standards.

Adjustments may also be required in the cost approach. Challenges in this area may include: consideration of replacement costs in the context of modern technology and ESG requirements or analysis of functional obsolescence and stranded assets.

Effective ESG integration requires access to relevant market data and deep understanding of the preferences of market participants. Data transparency and compliance with new ESG standards are key.

Impact on the property market

The new IVS promotes an integrated approach to property valuation, supporting long-term investment strategies. Properties with high ESG standards are gaining importance due to, among others, lower operating costs, higher energy efficiency, and better access to financing. ESG is no longer an add-on, but an integral part of modern property valuations.

ESG factors are becoming increasingly important in the real estate industry, both in the context of investment process and regulations. Their impact on property valuation requires in-depth analysis.

Valuers involved in the valuation of real estate face the challenge of considering ESG factors that can significantly affect the value of a property. In particular, it is crucial to understand the physical and transitional risks that may affect a property. In practice, this means integrating ESG data into the valuation process and being able to interpret it appropriately. However, the IVS in its publication indicates that the integration of ESG aspects into valuation is still in development and will evolve, and that this appears to be manageable within the existing IVS. ◢

The impact of ESG on property valuation according to TEGOVA

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In the latest European Valuation Standards (EVS) 2025, which became effective on 1 January, 2025, TEGOVA devotes a great deal of space to the impact of ESG issues on property value and valuation practice. Not only is there a separate EVS 6 dedicated to these issues, but there is also the entire Part VI of the publication entitled 'Valuation and Sustainability'.

The most important in this respect is the EVS 6 'Energy Valuation and Efficiency'. Its title indicates that energy efficiency issues and the implications of EU legislation in this area have been identified as a priority. The fact that specific and financially measurable obligations are imposed on property owners and tenants, as well as specific dates for complying with these obligations, has thus been identified as an important factor that can affect property values. In its main content, the EVS 6 specifies that 'a legal obligation to renovate a building to a higher level of energy efficiency by a fixed date or at a specific trigger point (e.g. sale, lease, major renovation) creates an unavoidable significant cost that affects the market value, as the owner will have to pay for the renovation work at this date or trigger point'[1]. Thus, 'valuers need to be aware of these legal deadlines and tipping points and, when they arise, to consider the cost of refurbishment deep enough to meet the required new level of energy efficiency or future requirements which are sufficiently close to coming into force and to consider the extent to which these costs affect the market value at the date of valuation'. The above-mentioned obligations derive primarily from the Energy Efficiency Directive[2] and the Energy Performance of Buildings Directive[3], the provisions of which, due to the nature of the legal act that is the Directive, still need to be transposed into the legal systems of member states, including Poland. However, even before this transposition has taken place, market participants are already aware of the legal requirements in this area and can be expected to take them increasingly into account in their investment decisions over time.

The commentary to the above standard provides specific guidance for valuers on how to estimate value. If there is no statutory deadline or 'tipping point' affecting the right to use or dispose of the property in question, making such rights conditional on the building remaining in a certain energy class (e.g. a prohibition on selling, renting, donating or converting the building unless it is in a certain energy class), and if there are a sufficient number of sales of similar properties that are also not subject to a statutory deadline, the valuer can determine the market value of the property using the comparative approach, without having to estimate the renovation costs.

However, if there is a statutory deadline or 'tipping point' affecting the right to use or dispose of the property, making these rights conditional on the building remaining in a certain energy class, the valu-

1 European Valuation Standards 2025, TEGOVA, Standard EVS 6, pp. 86-87

2 Energy Efficiency Directive (EU) 2023/1791 dated 13 September 2023

3 Energy Performance of Buildings Directive (EU) 2024/1275 dated 24 April 2024.

er should, in most cases, use the residual method to determine the market value of such a property. The commentary to EVS 6 also indicates a detailed procedure for the application of the residual method in the context of energy efficiency requirements for buildings.

In contrast, Part VI of the TEGOVA European Valuation Standards is a compendium of knowledge relating to ESG issues relevant to the real estate market and to the work of valuers in particular. The main climate risks and their possible impact on property values are discussed. It also discusses the mechanism of the evolution of the so-called Highest and Best Use of a property, which forms the basis of any estimate of the market value of a property, under the influence of environmental change. Among other things, attention was drawn to the gradual disappearance of opportunities to use certain properties in a certain way, which may, however, be replaced by the emergence of new opportunities as alternative uses of these properties.

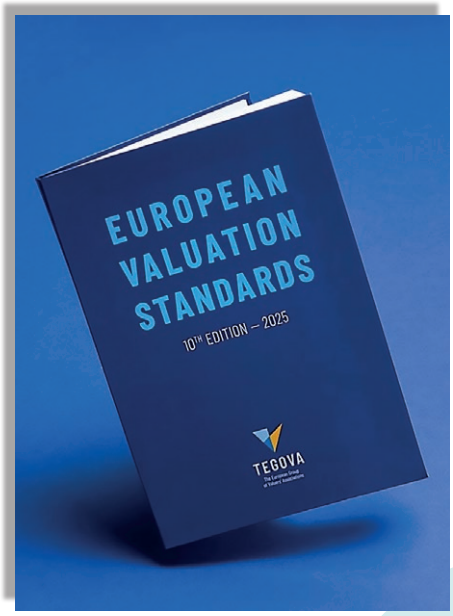
However, in a number of places in the most recent European Valuation Standards it is emphasised that valuers considering ESG factors in their valuations should be based on evidence from the property market and not simply on the expectations of themselves or a narrow group of enthusiasts that factor in their subjective view and feel as though it should have an impact on the value of the property. Such expectations can at most be reflected in opinions of individual value and only when they become characteristic of average efficient market participants can they be taken into account in market value assessments.

Emphasis is also placed on the increasing role of valuers', orientation in newer areas of specialisation, such as ecology, environmental pollution, costing, agriculture, natural resource management or law, etc. However, the breadth of knowledge in these new areas should only be broad enough to enable a proper understanding of the analysis reports of industry experts in these fields. By contrast, property valuers are not expected to perform such detailed analyses themselves.

Part VI of the EVS 2025 also contains a glossary of key ESG-related terms. So-called 'green value', 'green buildings' or 'green leases', among others.

The standards also provide an overview of the most important European Union legislation on ESG factors affecting property valuation. In each case, the factors that may influence the value of the property and that are related to the individual piece of legislation or European initiatives are highlighted. In this context, it was emphasised that the methods and techniques developed to date for property valuation are sufficient to allow valuers to reflect these factors in their valuations.

In summary, according to TEGOVA, it is expected that property markets will continue to assign a value according to the property use and its adaptability to new conditions by virtue of its characteristics. The role of the valuer, on the other hand, is to understand and correctly interpret these factors, as well as the reaction to them by the markets and then, with the help of available market evidence and professional judgement, to assign an appropriate value. ◢



TEGOVA resource

RICS global 'red book' for ESG real estate valuation standards

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In December 2024, RICS published updates to its property valuation standards, including the ESG aspects of valuation, which are effective from 31 January, 2025. The current RICS property valuation standards incorporate ESG criteria as an integral part of the valuation process. The changes to the Red Book reflect the International Valuation Standards (IVS), which came into force in January 2024, that need to be included in property valuation.

Formal inclusion of ESG criteria in the valuation process

ESG factors are a distinct substantive area in property valuation that will be assessed in terms of their impact on property value. As such, valuers are required to incorporate sustainable practices, constraints, and ESG risks into valuation reports. Environmental constraints on a property may be due to natural causes such as floods, fires, or earthquakes, or they may be unnatural constraints such as pollution or hazardous substances posing an environmental risk. In terms of environmental risk, it is crucial to consider the climate transformation of buildings, including assessing their adaptability to new technical requirements, energy efficiency, or decarbonisation in line with the EU Taxonomy and the EPBD, as well as the CRREM pathway.

Transformation risk can be included in the valuation using a specific assumption for the property being valued, meeting regulatory requirements for energy efficiency and decarbonisation if they are implementable.

An important factor defined for the first time in the new RICS standards, which should be taken into account in property valuation, is circularity, i.e. the principles of the circular economy ('CE'), concerning the use of building materials of existing or planned buildings for their reuse, ('buildings as material banks'). Circularity may appear in property valuation in the form of the residual ('residual') value of building materials, for which expertise in their dismantling, remediation, and attestation will be required to determine their reusability. Nevertheless, this area will require further guidance as well as achieving consistency with other global standards, e.g. accounting standards and financial reporting.

ESG areas to consider in valuation

Environmental: includes, but is not limited to, building energy performance certificates ('EPCs'), costs and potential revenues resulting from achieving optimum energy efficiency for the building; renewable and primary energy sources; CO_2 emissions and decarbonisation strategy, including costs required to implement the decarbonisation process; building waste management, including the use of CE; water resource efficiency, use of environmentally sustainable materials, climate change resilience, property-related biodiversity area.

Social: such as the location and infrastructure of the building's surroundings, accessibility of the building for all social groups, infrastructure for sustainable modes of transport; spaces conducive to the well-being of users, indoor air quality or the impact of the property on the local community.

Governance: covers issues such as, but not limited to, building safety, property land use management, 'green' leases or other formal and legal aspects related to property related ESG factors, accessibility of the building to respect the diversity of users, transparency of property owners' activities, including property-related transactions and their sources of financing, regulatory compliance, property management formula and standards.

ESG reporting in valuation

The new standards require valuers to clearly demonstrate how ESG factors have been incorporated into the analysis and how they affect the value of the property. It is the role of the valuer to reflect market behaviors as well as to consider ESG aspects and related key trends to consider the impact of ESG on property value in the short, medium, and long term.

Training

The new Red Book of ESG-related standards requires that valuers are adequately prepared to address the impact of environmental, social, and corporate governance factors in property valuations. Accordingly, RICS will make available training programs for valuers to prepare for the implementation of the new ESG standards into property valuations.

These changes aim to align property valuations with the growing importance of sustainability and ensure that investors and property owners receive valuation reports that take into account the impact of ESG on the value of their assets. ◢

RICS resource. RICS has published updates to its property valuation standards, including ESG aspects of valuation, which will be effective from 31 January, 2025

ESG in property valuation in Poland

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As the regulatory environment evolves, there is increasing pressure on the estate market participants, as well as an ongoing discussion on the impact of sustainability on property market values.

The complexity of the regulatory environment makes it difficult and challenging for property valuers to recognise which regulations are already relevant, how and when they will affect the behavior of market participants and, most importantly, how it will be translated into rents, yields, and property values.

Polish regulations and standards do not give recommendations how to include sustainability issues in valuations. However, this issue is becoming clearer and is transferred from conscious market participants, such as tenants, investors, and property managers to a wider range of market participants.

The current state of the real estate market allows for rather qualitative than quantitative consideration of ESG issues in valuation. Nevertheless, the widespread inclusion of sustainability issues in valuations, comparing to 3-4 years ago, represents a significant progress in this respect.

Considering the impact of ESG on valuations in Poland, the main emphasis is put on the description of property characteristics in terms of sustainability objectives, the analysis of key documents such as the Energy Performance Certificate (EPC) and green certificates, and the analysis of opex in terms of tenant charges and energy efficiency of the property. The analysis of climate risks is mostly limited to publicly available information on flood risks, including flash floods that can cause significant damage.

On the other hand, the requirements of bank institutions that are involved in real estate financing are crucial. Banks are subject to the SFDR Regulation and, as of 1 January, 2024, are obliged to report GAR (green asset ratio), i.e., an indicator representing the percentage of assets in the portfolio that are environmentally friendly, and must take into consideration taxonomy qualification criteria. For this reason, it has become a frequent requirement in bank valuations to describe the Energy Performance Certificate and multi-criteria certificates and, in case of German banks, to complete a more detailed questionnaire containing additional points such as:

- the source of renewable energy on the property
- any pollution present on the property
- green leases
- quality of the location in terms of access to sustainable public transport, bike paths, greenery
- features affecting the well-being of employees, such as indoor air quality, access to daylight lighting
- smart solutions to save water and energy in the building

There is another important ESG aspect related to capital expenditure (capex) on sustainability issues.; While issues related to certification, energy audits, and readily easily available solutions, such as replacing lighting with led lighting, usually represent a relatively small expense and are included in the valuation, large investments, such as the in-

stallation of heat pumps or photovoltaic panels, for example, resulting from ESG due diligence and are usually used by buyers to negotiate the price, and are challenging to be included into the valuation. Firstly, estimating costs in relation to refurbishments is not part of a typical property valuation process and the valuer must rely on information provided by the owner or property manager.

Secondly, although ESG risk capex should be treated like any other capital expenditure, the scale and pace of change resulting from market expectations and the changing regulatory environment, require a new approach to investments. From a decarbonisation audit emerges a picture of the property and its position on the decarbonisation path. Analysis of the planned capital expenditures covers the next five to seven years and includes significant amounts of modernisation works. It is crucial to distinguish whether the expenditure is to be incurred for the ongoing maintenance of the building's technical condition or whether it is to upgrade its technical performance and positioning.

However, when we consider ESG objectives, we are talking about securing future value, which is very important from the property owner's perspective, but may not affect the current value of the property. There is also little evidence in current market transactions.

It is worth adding that until a few years ago, investment outlays, among others, on environmental and social factors, could generate the so-called 'green premium', whereas now and in the coming years they will help primarily to maintain and prevent the loss of property value (the so-called 'brown discount').

Currently, there is no unified approach to the integration of ESG factors in valuation and the regulations in force in this area remain unclear or unadapted to the legal systems of the member states, including Poland. Difficulties in this area lead to the principle that all factors are sufficiently included in the capitalisation rate and rent.

Financial institutions are influencing property valuers with their increasing requirements to assess energy performance certificates or to take into account transformation risk, include the capex to retrofit an asset, and to adapt to new regulations in valuation. Important information at this point is the implementation of the EPBD in Poland, including the amendments to the regulation on the methodology of determining a building's energy performance, which will introduce energy classes and facilitate the assessment of property in terms of its energy efficiency. At present, the transparency and quality of certificates raise widespread objections, e.g. regarding the interpretation of indicators and the correctness of their preparation.

The lack of sufficient knowledge, as well as the fact that property valuers must rely on market evidence, also makes it difficult or impossible to consider the carbon footprint, the circularity issue, or the CRREM path towards decarbonisation of the sector in the valuation. ◢

WHAT IS THE GREEN ASSET RATIO (GAR)?

According to the EU Taxonomy Disclosures Delegated Act, the GAR refers to the proportion of a credit institution's assets that finance and are invested in EU Taxonomy-aligned economic activities as a proportion of the total covered assets.

In other words, the GAR is a ratio showing EU Taxonomy-aligned financial assets as a percentage of lenders' banking books.

ESG in valuation – experience from other countries

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Analysis of the situation in more mature markets in Europe (e.g. the UK) already provides ample evidence that rents in new, sustainable buildings are higher compared to buildings in the same location without high ESG factor ratings. Higher rents are also observed in buildings that have been retrofitted to improve the rating on the Energy Performance Certificate[1)].

The investment market in Europe, as in Poland, has been affected by the post-pandemic period, the energy crisis, and armed conflicts in many countries around the world. This has resulted in limited investment activity, especially for high-value properties (and these typically involve new, ESG-constructed buildings). Market evidence of yields acceptable to investors is therefore, relatively limited. In the process of selling real estate, it is observed that, in addition to the technical due diligence of the property, it is becoming standard practice to conduct ESG due diligence at the same time.

Furthermore, there is a strong focus on the fact that valuers should follow the market and not create it. It is therefore pivotal to correctly understand the profile of comparable properties in the context of ESG and make the relevant assumptions in the valued property.

Green premium

With the rapid growth of sustainable construction, ESG criteria in the building industry are starting to become the norm. This is particularly becoming apparent in the office and warehouse property sector, where the best buildings have to be green and sustainably built to be called 'prime'. This means that the real estate market is no longer talking about the 'green premium' for ESG factors, it is somehow becoming embedded in the definition of a prime building. All market participants are aware of this phenomenon, but it still causes many discussions between valuers and asset managers who expect a premium for ESG investments. More relevant in the current market conditions seems to be the occurrence of the brown discount.

1 Knight Frank analysed a sample of 130 retrofitted and refurbished office buildings across England and Wales. These buildings were upgraded from EPC C or below to EPC B or above, with many refurbishments also including additional amenities and general upgrades. We found that on average the retrofitted and refurbished offices saw the gap relative to prime rental levels close by 18 percentage points.

Green building appraisal criteria – country level regulations

In addition, the challenge for valuers in all markets remains the criteria for assessing buildings against ESG credentials when making asset pricing comparisons.

There is still no single market standard regarding building criteria that should be met to be classified as 'green'. There are no official guidelines as to whether such a building should comply with the technical criteria of the European Taxonomy, achieve a given class in the energy performance certificate, or have a green certificate such as BREEAM, LEED or WELL, and if so, which one or what would be their carbon footprint.

Based on the experience of other European countries, it seems that a first important step is to introduce clear regulations at the country level.

In markets where buildings have energy efficiency classes identified in energy efficiency certificates (e.g. Denmark, the UK, Austria), the basic criterion for assessing building energy efficiency is the above document.

Energy classes provide a better opportunity to compare buildings with each other, but have also enabled the introduction of minimum energy performance thresholds. A good example of this is the Minimum Energy Efficiency Standards for Buildings (MEES) policy in the UK, which sets minimum thresholds (classes) from which properties can be let. For example, currently commercial properties in the UK can be let if they have an energy class of at least E - ultimately the policy will be tightened, from 2028 this will be class C and from 2030 class B is under consideration. In France, on the other hand, from 2025, owners of a G-rated property will not be able to let it, while, from 2028 this will apply to F-rated properties. In addition, from 2021, French energy certificates are legally binding, meaning that buyers or tenants can seek compensation if a property does not meet the energy performance specified in the certificate. It is also worth noting that in France, information on a building's energy consumption is publicly available.

Building energy efficiency classification provides major convenience for the valuer, who can easily assess the property being valued in terms of meeting not only current but also future requirements.

> ***The challenge for valuers in all markets remains the criteria for assessing buildings against ESG credentials when making asset pricing comparisons***

The introduction of a zero carbon building standard at national level is also important. In 2024, for example, a pilot version of the UK Net Zero Carbon Buildings Standard was introduced, which provides detailed technical requirements that zero carbon buildings must meet based on the country's climate objectives. This standard is a voluntary tool for anyone wishing to assess whether an existing or proposed building will meet the zero carbon building objectives.

ESG-related CAPEX

As in Poland, the challenge remains in determining the scope of planned works and the costs associated with improving a given energy class. Some guidance for valuers in the UK is provided with the recommendations in the energy certificates themselves, where, in addition to the energy efficiency measures, the indicative cost of implementation is given, as well as the typical energy annual savings resulting from potential energy efficiency improvements.

However, the experience of appraisers in other countries indicates that it is still crucial to rely on the detailed costs obtained from the client and to keep in touch with the client in order to have a good understanding of the scope of the planned works. These costs should be verified with the market on the basis of the valuer's experience from other assignments or internal databases developed with building consultancy teams.

An example of such a study is shown below. This is a summary of refurbishment costs prepared by the construction consultancy team at Knight Frank UK (Spring 2024):

REF	Description	Cost	EPC Impact
1	**MEP Replacement**		
	Change from chiller and fancoil units to condensers and VRT	£ 30 – £ 40/ft²	Medium
	Replace AHU with more energy efficient version	£ 15/ft²	High
	Replacement gas fired boilers with air source heat pumps	£ 10 – £ 20/ft²	Medium
	LED lighting throughout with smart controls	£ 10 – £ 15/ft²	Low
	Point of use water heaters in lieu of boilers to WCs etc	£ 2.5 -£ 5/ft²	Medium
2	**External & Fabrics Works**		
	Repairs to windows seals and gaskets (incl. access)	£ 5 – £ 10/ft²	Low
	Renew flat roof finish with increased insulation	£ 3 – £ 7/ft²	Medium
	Replace existing glazed windows with triple glazing incl. access (cost based on area of glazing, not floor area)	£ 10 -£ 25/ft²	Medium
	Carry out an air permeability test, incl. necessary remedial works	£ 1 – £ 10/ft²	Medium

Sources: Landlord Refurbishment Cost Guide, Cost Consultancy, Spring 2024

It is worth noting that large institutional clients are slowly beginning to prepare decarbonisation strategies for buildings in their portfolios and to estimate the capex involved. However, in the experience of valuers so far it is not being shown in valuations. This is because it is associated with very high costs and there is a great concern among property owners that if it is directly included in the valuation, in the face of the current market conditions it will have a significant downward impact on the value of the property on a portfolio-wide basis.

Gathering data on ESG aspects

All valuers, both in Poland and Europe, struggle to obtain and analyse ESG data about the property being valued and comparable properties. Although included in the standard list of valuation documents, ESG information is very often omitted or provided in a form which makes it impossible to compare.

Some attempt to standardise the information collected was the paper "ESG data list for estate valuations" issued in February 2024 by RICS as a result of the RICS Europe Leaders' Forum works aiming to embed ESG requirements into real estate valuations (representatives of major real estate consultancies, banks, and financial institutions). This document summarises the 12 core ESG indicators which can be taken into account within valuation reports. Valuers in the Netherlands have already gone one step further and produced a document indicating 80 points.

The Netherlands, is one of the pioneers of the European real estate sustainability market hence the list of documents is more extensive.

It follows that each country will expand the list prepared by RICS depending on the degree of awareness, advancement of green building, and national guidelines.

It will be very difficult to prepare a standard tool that would allow an unambiguous assessment of ESG factors in real estate in all markets.

It is worth noting, however, that the first tools for collecting and managing ESG data are emerging on the market developed by private consulting or auditing firms. There is no standardised approach in this respect. In the Netherlands, for example, some companies use a special module within their valuation software, which prepares a sustainability assessment of the property in addition to the valuation report. The software also provides appraisers with access to a sustainability database and allows better comparison of properties with each other in terms of ESG aspects.

In summary, the experience of other countries in taking ESG factors into account in property valuation points to the importance of:

1. the implementation of sustainable projects as a mitigation of the risk of property value losses;
2. the introduction of regulations at the country level (energy classes, minimum energy requirements, definition of a zero carbon building);
3. the need for standardisation in terms of criteria for assessing real estate regarding ESG aspects which would allow property benchmarking;
4. the need for appraisers to collaborate and communicate effectively with all market participants in particular, property owners, financial institutions, and technical advisors in order to effectively understand market behaviour and the factors that influence investors' decisions. ◢

ESG DATA LIST FOR REAL ESTATE VALUATIONS

The RICS document "ESG data list for real estate valuations" summarises the 12 core ESG indicators which can be taken into account within valuation reports. Valuers in the Netherlands have already gone one step further and produced a document indicating 80 points.

EU Taxonomy – the key to a sustainable future

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Faced with the growing challenges of climate change and environmental degradation, the European Union has taken ambitious steps towards a sustainable economy. One of the key tools in this transformation is the EU Taxonomy, a classification system for sustainable development. This ground-breaking instrument aims to redirect activities and focus towards greener and more sustainable investments, thus supporting the objectives of the European Green Deal.

What is the EU Taxonomy?

The EU Taxonomy is a comprehensive classification system that determines which activities/solutions can be considered sustainable. It was introduced by Regulation (EU) 2020/852 of the European Parliament and of the Council of 18 June 2020 on establishing a framework to support sustainable investments.

The main objective of the Taxonomy is to create a common language and uniform criteria for investors, companies, and decision-makers to assess which economic activities contribute to the EU's environmental objectives.

The Taxonomy covers six main environmental objectives:

1. Climate change mitigation;
2. Adaptation to climate change;
3. Sustainable use and protection of water and marine resources;
4. Transition to a circular economy;
5. Pollution prevention and control;
6. Protection and restoration of biodiversity and ecosystems.

In order for a solution/action to be considered compliant with the Taxonomy, it must make a significant contribution to one or more of these objectives without harming the others (Do No Significant Harm principle, DNSH).

Impact on the real estate and construction sector

The real estate and construction sector is one of the key areas covered by the EU Taxonomy, due to its significant environmental impact and potential to reduce greenhouse gas emissions.

According to the European Commission, buildings account for 40% of energy consumption and 36% of greenhouse gas emissions in the EU. Slightly more than 70% is assumed to come from operational emissions (the life cycle of the building), while the so-called embodied carbon (materials / construction phase) accounts for about 30%.

The real estate sector is estimated to have a huge opportunity to reduce emissions, predicted to be as high as 50-80% by 2050.

These figures demonstrate the key role of the real estate sector in global efforts to reduce CO_2 emissions and combat climate change. They also show why initiatives such as the EU Taxonomy place a strong emphasis on sustainable construction and energy efficiency in buildings.

The Taxonomy sets out specific criteria for property-related activities, including:

- For new construction: In order for new buildings to be considered compliant with the Taxonomy, they must meet rigorous energy efficiency standards, often exceeding local requirements.
- Renovations: The Taxonomy encourages major renovations of existing buildings that lead to significant energy efficiency improvements.
- Acquisition and ownership of sustainable buildings: The Taxonomy sets out criteria for buildings that can be considered sustainable investments based on, among other things, their energy efficiency.

The impact of the Taxonomy on the real estate sector is multidimensional:

- Increased investment in green buildings: Clear sustainability criteria can encourage investors to redirect capital towards greener building projects.
- Pressure to retrofit: Owners of existing buildings may experience increased pressure to undertake refurbishments to improve energy efficiency and meet Taxonomy criteria – both from the market and existing or prospective Clients/Business Partners.
- Changes in property valuation: In the longer term, compliance with the Taxonomy is likely to become an important (or even key) factor influencing property values.
- New financing opportunities, as can already be seen in the market: Buildings meeting the criteria of the Taxonomy may have easier access to green financing and more favourable loan terms – or, presenting the issue from the other side – buildings not meeting the criteria of Taxonomy compliance will in all likelihood have more difficult access to financing and/or the cost of obtaining and servicing financing will be significantly higher for such properties.

Taxonomy in light of valuations

The introduction of the EU Taxonomy affects property valuations in Poland in several key ways:

Increased value of 'green' properties

Buildings meeting the criteria of the Taxonomy gain attractiveness in the eyes of investors and tenants, which translates into their theoretically higher valuation. In Poland, there is a growing interest in certified (BREEAM, LEED, DGNB – or similar) 'green' buildings, especially in the commercial property segment. Valuations of such buildings may gradually become higher than those of comparable but less sustainable properties. However, the situation in Poland in this respect is relatively favourable due to the large share of relatively new buildings – especially when compared to Western European countries.

Reducing the value of energy inefficient buildings

On the other hand, buildings with low energy efficiency or that do not meet the criteria of the Taxonomy may experience a decrease in value. However, in Poland, where a significant part of the building stock requires energy retrofitting, this may lead to significant changes in valuations in the near future, especially of older properties in less attractive locations. At the moment, however, this is not yet a phenomenon observed in the local market in Poland.

New criteria in the valuation process

Experts in property valuations in Poland are increasingly including criteria related to the EU Taxonomy in their valuations. Elements such as multi-criteria certificates, use of renewable energy sources, or adaptation to climate change are becoming important factors in the final valuation of a property. Valuers' awareness of these issues has increased in recent years and they are paying increasing attention to ESG aspects. This has also been necessitated by the introduction of regulations in property valuation standards, particularly those of an international nature. Also valuation procurers, especially financing banks, have different requirements for addressing ESG aspects during valuations. Thus, the knowledge and experience of valuers in this aspect is steadily increasing and they are becoming better able to advise and appraise properties in 'green' aspects.

Impact on capitalisation rates

Properties that are aligned with the Taxonomy may have lower capitalisation rates due to per-

ceived lower risk and higher liquidity. In Poland, this may lead to an increased popularity of prime 'green' assets. At this time, however, the premium from this has a limited application. However, these factors are expected to have an increasing impact on rates. Valuers are closely observing the market and the behaviour of transacting parties in order to capture the way ESG aspects are addressed in transactions and to try to quantify their impact on the level of cap rates and property values. However, these processes are happening quite slowly in the local market.

Modernisation costs vs. property value

Current property owners in Poland, especially those who are not the newest, are increasingly facing the challenge of investing in the modernisation of their assets in order to meet the criteria of the Taxonomy. Sometimes they are faced with the choice of upgrading (investing) or selling inefficient and therefore less attractive properties.

Upgrading costs have to be factored into valuations, which may lead to a short-term decline in the value of some properties, but long-term upgraded properties will gain greater attractiveness and value (after redevelopment and improvements have been made). In the case of older properties, valuers are much more sensitive to capex budgets and the need for any adjustment in valuations. In such cases, valuers also often ask for much more documentation in the valuation process to be able to estimate risks adequately.

Further integration of EU Taxonomy rules could have far-reaching implications for the real estate sector:

- Market transformation: In the longer term, a gradual transformation of the market towards more sustainable building practices and standards can be expected.
- Changing preferences of tenants and buyers: growing environmental awareness may lead to increased demand for 'green' properties, influencing prices and valuations as is already being seen in the market.
- Development of new areas of specialisation: likely development of specialisation in sustainable construction, energy efficiency and management of 'green' assets.
- Impact on urban planning: the Taxonomy criteria may influence the way cities are planned

THE TAXONOMY COVERS SIX MAIN ENVIRONMENTAL OBJECTIVES:

01 Climate change mitigation

02 Adaptation to climate change

03 Sustainable use and protection of water and marine resources

04 Transition to a circular economy

05 Pollution prevention and control

06 Protection and restoration of biodiversity and ecosystems

and developed in Poland, promoting more sustainable and climate-resilient urban solutions.
- Changes in real estate financing: Banks and financial institutions may offer preferential financing terms for projects that comply with the Taxonomy (in fact, they already do), which will further affect property valuations and investment attractiveness.

Summary

For the real estate and construction sector, the Taxonomy marks a new era in which sustainability becomes not only a matter of ethics, but also a key driver of investment decisions and asset value. As Europe follows a transformational path towards climate neutrality, the EU Taxonomy will play an increasingly important role in shaping the continent's future.

While in the short term this may lead to challenges in terms of compliance costs and changes in valuation methodologies, in the long term it will contribute to a more sustainable and resilient real estate sector.

For valuation experts, investors, and other real estate market participants, understanding and incorporating the criteria of the Taxonomy into decision-making and valuations becomes crucial for success in the new market reality. There is a systematic increase in the awareness and knowledge of real estate valuation and analysis experts, which translates into more professional advice in this area. At the same time, this transformation is opening up new business and investment opportunities that can contribute to modernising and increasing the competitiveness of the Polish real estate sector internationally. Processes related to addressing ESG aspects in real estate transactions and valuations are becoming a new reality, but are occurring relatively slowly. However, they may accelerate in the years to come.

As Poland continues its journey towards a more sustainable economy, the real estate sector will play a key role in meeting the country's climate and environmental goals. By influencing valuations and investment decisions, the EU taxonomy is becoming a catalyst for these changes, shaping the future of the Polish real estate market in a greener and more sustainable direction.

In Poland, the first official guidelines and recommendations for the EU Taxonomy in the construction and real estate sector appeared in 2024.

Summary

The Ministry of Development and Technology has published:

- A Frequently Asked Questions and Answers (FAQ) guide on the interpretation of selected technical qualification criteria of the EU Taxonomy for business activities related to construction and real estate.

- A Business Guide to the Application of Minimum Guarantees under the EU Taxonomy, which clarifies aspects related to compliance with the OECD Guidelines and the UN Guiding Principles, as well as the implementation of the various stages of due diligence processes in companies.

These documents provide important support for investors and developers seeking to meet the requirements of the EU Taxonomy and implement projects in accordance with the principles of sustainable development.

In 2024, the work of a working group at the Polish Chamber of Commercial Real Estate (PINK) bringing together representatives of PINK member companies and a dozen banks produced a publication entitled 'ESG criteria: new challenges for banks and requirements for the real estate sector'.

In addition, last year, on the initiative of the Sustainable Investment Forum Poland (POLSIF) and in cooperation with PINK, the Polish Council of Shopping Centers (PRCH), the Polish Green Building Council PLGBC and JWA, a Working Group was set up consisting of experts from the real estate sector and representatives of the largest banks in Poland. The result of the group's work is a document that clarifies the documentary requirements expected from real estate clients by financial institutions in terms of property's compliance with the technical criteria of the EU Taxonomy classification.

The document promotes dialogue between the financial sector and investors, enabling the creation of common principles of action, particularly in the context of combating climate change. Its importance is also underlined by its referral for consultation to the Working Group on the Application of the EU Taxonomy at the Ministry of Development and Technology, making it an important step in the development of the Polish real estate and finance market.

Valuers are waiting for the ESG related issues set out above to be incorporated into Polish legislation. Undoubtedly, recommendations on how to incorporate sustainability issues into valuation would underline the importance of the subject and further educate the valuation community on the subject.

PARTNERZY

The Polish Chamber of Commercial Real Estate (PINK) brings together representatives from all sectors and services of the commercial real estate market within a single organization, enabling them to exert a tangible influence on the surrounding economic, political, and social environment. PINK serves as both their representative and a platform for the exchange of experience, knowledge, and collaboration. Working with other organizations, it promotes best practices in the commercial real estate market. The association includes developers, investors and asset managers, property managers, project companies, and construction consultants, real estate market advisors, as well as legal, tax advisory, and financial services providers.

PINK's publication can be found at: **www.stowarzyszeniepink.org.pl**

Polish Council of Shopping Centres (PRCH) is the largest non-profit association in Poland, bringing together nearly 200 entities from the retail and services sector.

PRCH has represented the members of the association in the business, political and social environment for 22 years. It works towards the development of the sector by participating in the development of legal solutions and by creating a positive image of retail assets. The Council participates in the creation and promotion of market standards by collecting, analysing, and presenting reliable data on the industry and its development trends. Polish Council of Shopping Centres is a substantive voice of the sector regarding legal regulations

PRCH is a reliable content partner for the media, government representatives and other industry organisations, providing analyses and reports based on reliable shopping centre data. The Council analyses and reviews regulations affecting the operation of retail assets.

Więcej informacji można znaleźć na: **www.prch.org.pl**

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