AHEAD OF THE WAVE

Financing the transition to a decarbonised built environment

#BUILDINGLIFE

EUROPE REGIONAL NETWORK

WORLD GREEN BUILDING COUNCIL

Opening

About World Green Building Council

The World Green Building Council (WorldGBC) is the largest and most influential local-regional-global action network, leading the transformation to sustainable and decarbonised built environments for everyone, everywhere.

Together, with 75+ Green Building Councils and industry partners from all around the world, we are driving systemic changes to:

- Address whole life carbon emissions of existing and new buildings
- Enable resilient, healthy, equitable and inclusive places
- Secure regenerative, resource efficient and waste-free infrastructure

We work with businesses, organisations and governments to deliver on the ambitions of the Paris Agreement and UN Global Goals for Sustainable Development (SDGs).

The Europe Regional Network (ERN) is a community of over 20 national Green Building Councils, 8 Regional Partners, and close to 5,000 members across Europe. Green Building Councils in the ERN are from both EU and non-EU countries.

About #BuildingLife

#BuildingLife is a project convening 10 European Green Building Councils to support the European Green Deal. These Green Building Councils galvanise climate action through national and regional decarbonisation roadmaps, which tackle the whole-life environmental impacts of the building and construction sector.

#BuildingLife focuses not only on the operational emissions of buildings, but also the environmental impact of the manufacturing, transportation, construction, and end-of-life phases – often called embodied emissions.

Tackling these emissions is essential to address the total impact of the built environment, and progress towards the European Green Deal's aim of a climate neutral Europe by 2050.

The Green Building Councils (GBCs) spearheading the project are: Croatia, Finland, France, Germany, Ireland, Italy, the Netherlands, Poland, Spain and the UK.

#BuildingLife has received funding from the IKEA Foundation and Laudes Foundation as well as from European Bank for Reconstruction and Development and the European Climate Foundation.

#BuildingLife Funders

Laudes Foundation

IKEA Foundation

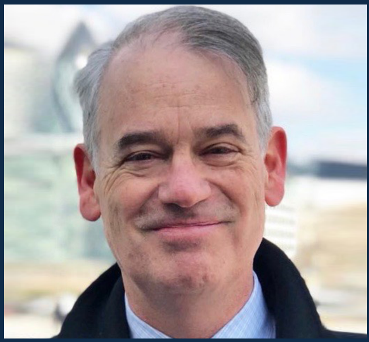
Foreword

"Green investing is a no-brainer for the building and construction sector; for mitigating against climate and financial risks, as well as creating better social value for our communities. Simply put, if you're not investing in sustainable buildings now, then you're not long-term investing. We need a deep systemic shift to transition financial flows towards decarbonised, resilient and equitable built environments. And I am proud of the work that our European Green Building Councils have been doing to accelerate this shift."

Cristina Gamboa,
CEO, World Green Building Council

"Green investing is key in the race to stop catastrophic climate change. The insurance industry is already facing losses due to multiplying climate hazards. Shifting current finance flows towards a decarbonised built environment is therefore critical and I welcome the work that WorldGBC and national GBCs have been doing to enable this."

Sean Kidney,
Climate Bonds Initiative CEO & member of WorldGBC Board of Directors



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European member Green Building Councils and Regional Partners

WorldGBC's call to action to the European finance and real estate sectors

Don't wait, invest

In light of the climate, energy and resource crises, there is no excuse for inaction: stakeholders in the finance and real estate sectors need to invest in the transition towards a decarbonised built environment. Financial actors should make use of existing data, tools, frameworks and best practice in the market to inform their decision-making.

The EU and its Member States are developing comprehensive sustainable finance policies, most prominently the EU Taxonomy that started taking effect in 2021. The EU Taxonomy and other key policies are still works-in-progress and a lack of clarity and data poses difficulties in implementing the policies.

Real estate and financial actors do not need to wait to take action until more clarity is given – they should use existing resources to guide their financial decisions towards a sustainable built environment, such as robust voluntary frameworks. Investments in no-regret measures that follow the energy efficiency first principle and take a whole life cycle approach can be taken now despite a perceived lack of data.

Preparing the shift of finance flows and financial activities towards a sustainable built environment runs along three key pillars:

Disclose	Set targets	Implement
portfolio data and information	towards a zero emission, resilient and circular built environment	no-regrets actions to have first impacts, kick-start the learning curve, and build and/or increase institutional capacities. National or regional roadmaps (like those in the #BuildingLife campaign) can help identify these actions

Roadmaps and voluntary frameworks pave the way

Evidence suggests that financial markets are increasingly directing their investments towards projects and companies that guarantee the achievement of social and environmental development goals – in addition to economic profitability. However, there is still confusion in the market on what short term actions to take, how to develop mid to long term decarbonisation pathways and how to demonstrate progress towards set targets.

Green Building Councils in 10 European countries have published National Decarbonisation Roadmaps to guide the transition of the sector. These roadmaps, produced under the WorldGBC #BuildingLife project, clearly set out short, medium and long term actions. They are an invaluable resource for investors seeking clear, actionable guidance to start making immediate carbon reductions.

Figure 1: Overview of 10 BuildingLife national roadmaps to decarbonise the built environment.

Complementary to national roadmaps, voluntary frameworks, like GBC-run sustainable building certification schemes, can guide sustainable actions and the shift to sustainable finance. Voluntary frameworks allow a common language amongst stakeholders such as between architects, construction companies, manufacturing companies, investors and funders.

The use of voluntary frameworks is key to showcase action by front-runners and to demonstrate progress towards targets – especially when closely linked to policies (e.g. compatible methods, tools and data). First evidence suggests a correlation between EU taxonomy eligibility and voluntary certification schemes: certified projects seem to have a higher rate of eligibility in comparison with non-certified projects, both for the climate change mitigation and the Do No Significant Harm (DNSH) criteria of the EU taxonomy[1].

1 DGNB, DK-GBC, GBCe, ÖGNI, 2021. EU Taxonomy Study: Evaluating the market readiness of the EU taxonomy criteria for buildings.

The faster we mobilise the real estate industry in a collective manner, the faster we will catalyse change – costs will fall, skilled labour and know-how will increase and awareness amongst all stakeholders will be higher.

To build the required know-how, build institutional capacities and push for a collective effort for robust and ambitious sustainability claims – we call on the real estate and finance sector to commit to action that aligns with existing roadmaps and voluntary sustainability frameworks.

What is a sustainable building certification?

Sustainable building certifications – also known as green building rating tools – are used to assess and recognise buildings which meet certain sustainability requirements or standards.

Building certifications recognise and reward companies and organisations who build and operate greener buildings, thereby encouraging and incentivising them to push the boundaries on sustainability.

They kick-start the market by setting standards that in turn elevate the ambition of government building codes and regulation, workforce training, and corporate strategies.

Certifications vary in their approach and can be applied to the planning and design, construction, operation, maintenance, renovation, and eventual demolition phases of a building.

Sustainable building certifications can also differ in the type of buildings they are applied to, with specific tools or subsets of tools used for different building types such as homes, commercial buildings, or even whole neighbourhoods.

Background

The European building sector is currently responsible for 42% of the final energy consumption[2] and close to 36% of emissions[3] – with half of emissions due to the on-site combustion of fossil fuels and the other half from the use of electricity and heat[4].

The current gas and oil crisis in Europe has a large impact on housing costs and disproportionally affects vulnerable households. Of households' final energy consumption two-thirds is to heat their homes and one third comes from natural gas[5]. In 2020, 8% of the EU population said that they were unable to keep their home adequately warm[6] and since March 2022 the average inflation rate on natural gas across the European Union had risen by close to 40% compared to the previous year, although it went to a 25% increase in December 2022[7].

A sustainable built environment is not only a necessity to limit global warming, but it also strengthens political stability, energy security, and comes with a wide range of social benefits such as reduced pollution, better thermal comfort, job creation and reduced energy bills[8]. The IEA estimates that shifting finance flows away from fossil fuels in buildings (including energy systems) towards energy efficiency measures would reduce household spending on energy by half by 2050[9].

Carbon emissions are released not only during operational life but also during the manufacturing, transportation, construction and end of life phases of all built assets – buildings and infrastructure. These emissions, commonly referred to as embodied carbon, have largely been overlooked historically but contribute at least 9% of all global carbon emissions[10,11]. Embodied carbon will be responsible for half of the entire carbon footprint of new construction between now and 2050, threatening to consume a large part of our remaining carbon budget.

Our network of GBCs is mobilised to support investors and asset owners, ensuring ESG reporting and verification of the performance of built assets – across their whole life cycle – is streamlined and robust.

2 European Environment Agency (EEA), 2020. Final energy consumption by fuel type and sector.
3 European Parliament, 2021. Draft Report on the implementation of the Energy Performance of Buildings Directive (2021/2077(INI)).
4 European Environment Agency (EEA), 2022. Greenhouse gas emissions from energy use in buildings in the EU.
5 Eurostat, 2022. Energy consumption in households.
6 Eurostat, 2021. 8% of EU population unable to keep home adequately warm.
7 Eurostat, 2022. HICP – monthly data (annual rate of change). Values retrieved 19 January 2023.
8 Climate Action Network (CAN), 2022. How to maximise the social benefits of climate action – Scoping exercise.
9 International Energy Agency (IEA), 2019. The Critical Role of Buildings – Perspectives for the Clean Energy Transition.
10 World Green Building Council (WorldGBC), 2019. Bringing Embodied Carbon Upfront.
11 UNEP, 2022. 2022 Global Status Report for Buildings and Construction: Towards a Zero-emission, Efficient and Resilient Buildings and Construction Sector.

The power of collaborative efforts

To achieve a decarbonised built environment the academic, public, private and financial sectors must come together. The active participation of the financial sector ensures projects can be delivered while the other stakeholders can create the technological and political frameworks to guide the best course of actions.

GBCs provide bottom-up technical expertise that can guide sustainable financing in the built environment. National GBC-run certification schemes have been at the forefront of enabling sustainable finance and ESG reporting, underpinning the ESG benchmark GRESB, for more than a decade, forming the basis for many of the first green bonds and sustainability linked loans and green mortgages, for example through the EeMAP project. GBC-run certification schemes are an established, de facto gold standard in the real estate market.

WorldGBC's Europe Regional Network (ERN) has leveraged this pioneering work to cement our role and influence in the implementation of sustainable finance for the built environment. We have shaped and defined green mortgage standards, influenced the recommendations of the first Technical Expert Group (TEG) on climate mitigation criteria for the EU Taxonomy and subsequently steered the definition of technical screening criteria for the building sector in the EU Platform on Sustainable Finance.

Our recognised expertise in sustainable finance comes from decades of experience in defining the environmental performance standards for buildings and infrastructure, our network's role as a catalyst for political and industry action through advocacy, training and awareness raising.

Financing the transition to a decarbonised built environment

Sustainability is becoming an integral part of the business case for the real estate market. Market participants cannot afford not to be part of the sustainability movement – from an ethical, financial, risk mitigation or future-proofing perspective[12].

Financial markets are increasingly directing their investments towards projects and companies that guarantee the achievement of social and environmental goals. A first set of financial institutions committed to align USD 130 trillion of private capital with the goals of the 2015 Paris Agreement by 2050 through the Glasgow Financial Alliance for Net Zero (GFANZ)[13].

The finance sector is well-positioned to boost the transition to a sustainable built environment and it should take advantage of its leverage. Financial actors' investment, lending, and insurance underwriting decisions shape tomorrow's real economy. Investment decisions taken today will have repercussion on the built environment in the years to come, so sustainability needs to be anchored in the finance and real estate sectors as soon as possible.

Climate change presents one of the most severe financial risks to the global economy but the 'exact timing and severity of physical effects are difficult to estimate'[14]. Real estate is a major asset class accounting for 10% of global GDP and is at risk from both physical and transition risks. The potential impact of climate change related effects is in the order of USD 16 trillion on residential assets and USD 5 trillion for commercial assets[15]. It is important that financial actors in the built environment also consider transition risks from new and upcoming EU and national legislations as well as technology, market and reputation risks (see Table 1 for more information).

The creation, renovation and maintenance of a sustainable built environment offers large scale financial opportunities from both a market competitiveness and risk mitigation perspective. Financial institutions need to consider key environmental objectives in all financial decisions. Achieving these objectives in the built environment requires enormous amounts of upfront investments and these investments require a drastic upscaling of funding options such as standardised and innovative funding models. The finance sector needs to prepare for a deep transformation of the real estate and built environment sectors – this includes understanding the fall outs of these transformations.

However, currently the finance sector's potential to support increased climate action in both debt and equity markets is underutilised and the links between financial activities and their impact on emissions in the real economy are poorly understood[16].

12 WorldGBC, 2021. Beyond The Business Case.
13 GFANZ, 2021. Amount of finance committed to achieving 1.5°C now at scale needed to deliver the transition.
14 TCFD, 2017. Recommendations of the Task Force on Climate-related Financial Disclosures.
15 Muldoon-Smith & Greenhalgh, 2019. Suspect foundations: Developing an understanding of climate-related stranded assets in the global real estate sector.
16 NewClimate Institute, 2022.Making finance consistent with climate goals? Taking stock of the financial sector's climate related investment commitments.

Table 1: Key financial actors to finance the transition to a sustainable built environment[17].

Financial actor	Key characteristics with regard to a sustainable built environment	Key physical and transition risks
Banks	Banks offer debt products to individuals (e.g. housing loan, mortgage) and businesses to finance the purchase, construction and/or renovation of buildings.	Climate change induced natural disasters and chronic climate patterns may affect assets and hinder borrowers' ability to repay borrowed capital.
Asset managers	Asset managers perform the service of increasing total wealth over time by acquiring, maintaining, and trading investments in real estate.	Asset managers that do not prepare for transition risks may have reduced demand for products and services and may be subject to write-offs and early retirement of existing assets.
Institutional investors	Institutional investors can be mutual or pensions, and insurance companies that invest on behalf of their clients. They have the resources and expertise to research a variety of investment opportunities and can favour large-scale long-term investments required for a sustainable built environment.	Investment portfolios may be subject to write-offs and early retirement of existing assets (e.g., damage to property and assets in "high-risk" locations) as well as reduced revenue and higher costs from negative impacts on portfolio assets.
Property developers	Property developers buy and/or construct buildings to sell and/or rent floor space.	Project opportunities may be subject to decreased value from transition risks and increased costs to adopt/deploy new practices and processes (e.g. higher materials costs due to additional research and development (R&D) for low-carbon materials).
Real Estate Investment Trust (REITs)	REITs are publicly traded companies that own, operate or finance income-producing properties and typically have more capacity to act on a larger scale and manage large properties such as building complexes.	REITs may be subject to increased operating costs (e.g., higher compliance costs, increased insurance premiums), to higher capital costs for energy intensive assets, and to the risk of stranded assets (e.g. assets too expensive to retrofit).
(Re-) Insurance companies	Individuals and businesses use insurance companies to protect against financial loss, for example due to accidents or property damage.	Acute and chronic physical risks may require increased insurance premiums and/or reduce availability of insurance on assets in "high-risk" locations to compensate for increased insurance costs.

17 Table based on, and adapted from, the Recommendations of the Task Force on Climate-related Financial Disclosures (TCFD, 2017).

The EU's sustainable finance policy package

The financial sector must take swift action to preserve its stability and limit damages caused by climate change. As policymakers move to enhance sustainability considerations the real estate and finance sectors need to effectively and proactively consider potential regulatory risks.

With the landmark Paris Agreement to limit global warming well below 2°C aiming for 1.5°C it became clear that all sectors will have to take action. The EU set up the High-level Expert Group on Sustainable Finance (HLEG) in December 2016 – one year after the Paris Agreement – to consider the role of and implications for the finance sector.

The EU's financial regulations reform package kicked in on 7 March 2018, with the European Commission's action plan for financing sustainable growth – based on the recommendation of the Expert Group, which included the idea of a European Taxonomy of sustainable activities.

Amongst the sustainable finance policy package three distinct policies stand out. The EU Taxonomy regulation establishes a framework to define sustainable economic activities, whilst the Sustainable Finance Disclosure Regulation and the Corporate Sustainability Reporting Directive mandate a set of financial actors (or products) and corporate actors to disclose their eligibility and alignment to the EU Taxonomy, thereby enhancing transparency of climate exposure risks and tackle greenwashing (see Table 2).

The European Green Bond Standard is a complementary policy of these three. It is a voluntary standard to help scale up and raise the environmental ambitions of the green bond market.

There are four key requirements under the proposed framework.

- The funds raised by the bond should be allocated fully to projects that are aligned with the EU Taxonomy.
- Full transparency is required on how the bond proceeds are allocated through detailed reporting requirements.
- All European green bonds must be checked by an external reviewer to ensure compliance with the Regulation and taxonomy alignment of the funded projects.
- External reviewers providing services to issuers of European green bonds must be registered with, and supervised by, the European Securities Markets Authority (ESMA). This ensures that the quality of their services and reliability of their reviews protects investors and market integrity.

Table 2: Summary of three key sustainable finance legislations in the EU.

EU Taxonomy regulation[18]	Sustainable Finance Disclosure Regulation	Corporate Sustainability Reporting Directive
Establishes a framework to facilitate sustainable investment, essentially providing a common set of rules to define sustainable economic activities Categorises sustainable economic activities using the NACE framework[19] Defines the significant contribution to six environmental objectives – actors can chose one of the six Defines Do No Significant Harm criteria for the other five objectives Minimum Safeguards e.g. UN Guiding Principles on Business and Human Rights	Seeks to improve transparency in the market for sustainable investment products, to prevent greenwashing and to increase transparency around sustainability claims made by financial market participants Mandates ESG disclosure obligations for asset managers and other financial markets participants at entity and product level Double materiality: Actors must disclose environmental impacts on financial institutions and products as well as the impact of investment decisions on the environment, referred to as the principal adverse impacts (PAIs)	Amends the existing reporting requirements of the Non-financial reporting directive (NFRD) Mandates the disclosure of EU Taxonomy alignment as well as the impacts of environmental risks on economic activities (double materiality[20]), and in compliance with the EU sustainability reporting standards (ESRS) Applies as of January 2024 to around 12 000 companies already subject to the NFRD – as of 2025 approximately 50,000 companies need to comply Third party "limited assurance"[21] is mandatory in the reporting, followed by "reasonable assurance"[22] in a few years

18 Complementary to the EU Taxonomy Regulation the European Commission released the Climate Delegated Act – Regulation (EU) 2021/2139 defining substantial contribution criteria for 1. climate change mitigation, 2. climate change adaptation, and setting do no significant harm criteria for 3. transition to a circular economy, 4. pollution prevention and control, 5. sustainable use and protection of water and marine resources, and 6. protection and restoration of biodiversity & ecosystems.

19 NACE is the acronym used to designate the various statistical classifications of economic activities in the EU.

20 European Sustainability Reporting Standards include double materiality requiring companies to disclose material (of relevance) climate-related impacts on the company as well as impacts of a company on the climate.

21 "The conclusion of a limited assurance engagement is usually provided in a negative form of expression by stating that no matter has been identified by the practitioner to conclude that the subject matter is materially misstated."

22 "The amount of work in a reasonable assurance engagement entails extensive procedures including consideration of internal controls of the reporting undertaking and substantive testing, and is therefore significantly greater than in a limited assurance engagement."

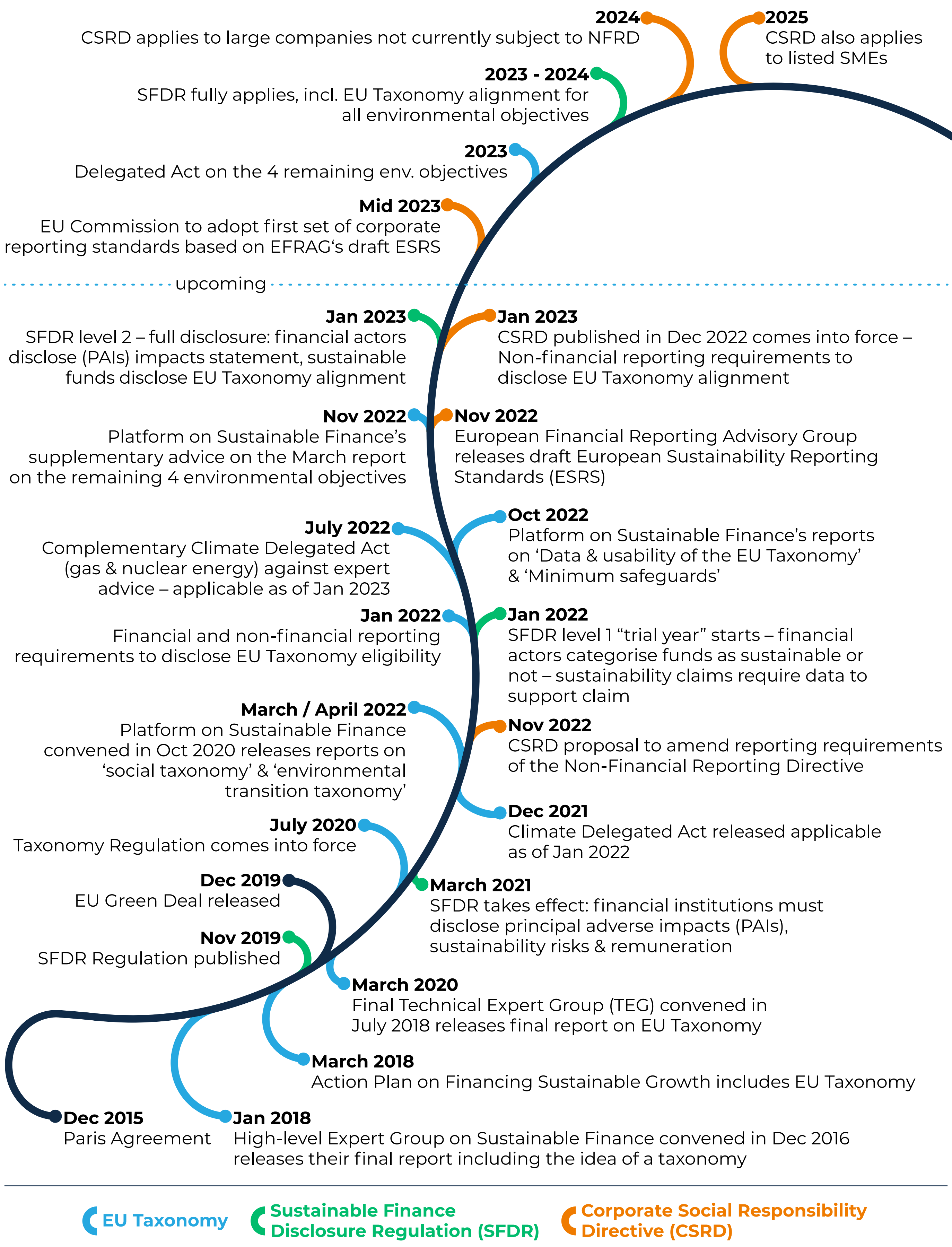

Figure 2: The legislative wave: milestones of key sustainable finance policies in the EU.

Non-financial policy developments also have a considerable impact on the European real estate sector influencing financial activities in the European building sector.

The Energy Performance of Buildings Directive (EPBD) is the single most important of non-financial legislations. The EPBD is currently under review to better align with the goals of the EU Green Deal and Fit for 55 package. As part of this, the European Commission proposed a revision text in December 2021, which included the following measures:

- Minimum Energy Performance Standards (MEPS): The European Commission proposed to introduce minimum energy performance standards for existing buildings – currently only new buildings are subject to MEPS. The MEPS would require that existing buildings improve their Energy Performance Certificate ratings, with different trajectories set for public, non-residential and residential building types.
- Zero Emission Buildings (ZEB): The Commission proposal introduces a new definition for ZEBs, which are classed as buildings 'with a very high energy performance'. All new buildings would need to be ZEBs by the start of 2030 (2027 for all new public buildings).
- Whole Life Carbon (WLC) reporting: Under the Commission proposal, all new buildings would have to calculate and disclose their Global Warming Potential (GWP) from 2030, with the recommended use of the Level(s) framework, a requirement that would apply to new buildings larger than 2,000 square metres from 2027.
- Energy Performance Certificates (EPC): According to the Commission proposal EPCs should be harmonised across the EU by 2025 and rescaled with "a view to the common vision for a zero-emission building stock by 2050". A new set of mandatory EPC indicators has also been proposed for EPCs, which include calculated final energy use/consumption alongside primary energy use/consumption. WLC disclosure is an 'optional indicator' at present.
- Building Renovation Passports: Building Renovation Passports set out step-by-step deep renovation roadmaps for individual buildings. The Commission proposed that by the end of 2024 – latest 2025, Member States shall introduce a scheme of renovation passports.

It is also noteworthy that beyond the translation of EU directives at the national level some Member States are taking the lead on more ambition in the building sector. For example, Denmark, Finland, France, the Netherlands and Sweden have reporting requirements on embodied carbon in place or have proposed requirements for new buildings, which include maximum thresholds of GHG emissions. These countries pave the way for whole life carbon regulations – beyond only operational energy and carbon emissions but issues remain regarding the degree of flexibility in the building assessments and the type of data that can be used[23].

The Level(s) framework provides a harmonised and EU-approved methodology for assessing the environmental impact of buildings, including Whole Life Carbon (WLC). The European Commission developed the Level(s) framework based on the European standard EN 15978 and GBCs have extensively supported its development and piloting. Most green building rating schemes in Europe (including those run by GBCs) align or are aligning with Level(s).

Level(s) is cited in the 2021 EPBD revision text and the EU Taxonomy Regulation as a methodology to report building's Global Warming Potential (GWP).

23 Ramboll, 2022. Whole life carbon models for the EU27 to bring down embodied carbon emissions from new buildings Review of existing national legislative measures.

Available frameworks and resources for climate change mitigation financing

As the demand and supply for sustainable finance in the built environment is growing, continuous work is underway to enhance data granularity. Moreover, standardised definitions and more transparent frameworks are being developed to equip the finance community with appropriate tools to identify the level of sustainability amongst projects and thus avoid greenwashing.

Pledging to realign finance towards a sustainable built environment

In recent years a global wave of net zero targets expanded to finally cover around 90% of the global economy[24]. The financial sector has followed suit by joining the net zero wave and/or pledging to align financial activities with 1.5°C.

Most prominently the Glasgow Financial Alliance for Net Zero (GFANZ), a global coalition of leading financial institutions, committed to accelerating the decarbonisation of the economy to limit global warming to 1.5°C[25]. According to the coalition, "every company, bank, insurer, and investor will need to adjust their business models, develop credible plans for the transition to a low-carbon, climate-resilient future, and then implement those plans"[26]. The Coalition has, however, faced several issues to balance inclusion of financial actors with ambition of the pledges[27 28 29].

In the building and construction sector, WorldGBC's global climate action programme Advancing Net Zero works towards total sector decarbonisation by 2050. Working with 34 Green Building Councils across the network the initiative develops tools, programmes and resources to promote the urgency and achievability of zero carbon buildings and build industry capacity to deliver them. The initiative comprises 170 signatories, including financial actors such as Deutsche Bank, Goldman Sachs, Natwest, Lloyds Bank Group and Commonwealth Bank Australia, covering almost 20,000 assets and accounting for 7.3 million tonnes of carbon dioxide emissions.

The Net Zero Carbon Buildings Commitment requires that by 2030:

- New developments and major renovations are built to be highly efficient, powered by renewables, with a maximum reduction in embodied carbon and compensation of all residual upfront emissions.
- Existing buildings reduce their energy consumption and eliminate emissions from energy and refrigerants removing fossil fuel use as fast as practicable

24 Net Zero Tracker, 2022. Recommendations and current realities.
25 The GFANZ coalition includes the following sub-coalitions: Net-Zero Asset Owner Alliance (NZAOA), Net-Zero Asset Managers initiative (NZAM), Paris Aligned Asset Owners (PAAO), Net-Zero Banking Alliance (NZBA), Net-Zero Insurance Alliance (NZIA), Net Zero Financial Service Providers Alliance (NZFSPA), Net Zero Investment Consultants Initiative (NZICI).
26 GFANZ, 2022. Glasgow Financial Alliance for Net Zero.
27 Financial Times, 2022. Gfanz drops its Race to Zero requirements.
28 Financial Times, 2022. COP27: Mark Carney clings to his dream of a greener finance industry.
29 Bloomberg, 2023. Wall Street's CO2 Agenda Drives Green Bank to Quit Alliance

Planning the pathway to zero emissions

There are several approaches for actors in the finance and real estate sectors to equip themselves for the transition towards a whole life zero carbon built environment. One approach to inform financial decisions is the setting of emissions and emissions intensity pathways based on a carbon budget approach.

Planning for the construction of decarbonised built assets can be straight-forward with a multitude of criteria and certification schemes to use. Decarbonising the entire sustainable built environment, however, requires the decarbonisation of existing buildings as well. Because the current stock cannot be simultaneously renovated, tools and frameworks can help to plan the decarbonisation pathways.

In response to the need for planning the transition of the wider building stock and especially from real estate actors, several tools are now available. Essentially the goal of these tools is that financial actors can set targets informed by a decarbonisation pathway and align financial decisions to the emissions (intensity) trajectory.

Despite the usefulness of setting an energy and emissions intensity pathway, there are several difficulties of that exercise to be aware of. Top-down emission pathways rely on a multitude of assumptions around carbon budgets and assume homogeneous action of all stakeholders in the building sector. Therefore, divergences persist with current pathway methodologies.

For example, the Carbon Risk Real Estate Monitor (CRREM) aims to support the industry to tackle transition risks, e.g. arising from changing market expectations and legal regulations, and thus foster investments in energy efficiency to avoid 'stranded' properties "that will not meet future energy efficiency standards and whose energy upgrade will not be financially viable"[30].

At the national level, leading tools for decarbonisation that have been developed and adopted by industry include Dutch GBC's ParisProof, German Sustainable Building Council (DGNB) Klimapositiv, Ireland GBC's Home Performance Index, LEED Zero or the UK Net Zero Carbon Building Standard (forthcoming).

Implementing action – key principles to guide financing decisions

Resources such as the national and European roadmaps under the #BuildingLife project, clearly set out short, medium and long term actions. Such resources are valuable for financial actors seeking clear, actionable guidance to start making immediate and no-regret emission reductions.

Emissions from the construction, renovation and disassembly of buildings

Embodied carbon in the built environment contributes approximately 9% of all carbon emissions globally for the construction, renovation, deconstruction or demolition and the wider supply chain of a building; and another 6% for "other building and construction industry" referring to concrete, steel and aluminium emissions for infrastructure construction[31][32]. Embodied carbon is estimated to contribute between 10–20% of the EU's building carbon dioxide footprint, depending on factors such as building type and construction technique and materials. In countries with low-carbon energy, the embodied share can already be as high as 50%[33].

30 CRREM, 2023. Carbon Risk Real Estate Monitor.
31 UNEP, 2022. 2022 Global Status Report for Buildings and Construction: Towards a Zero-emission, Efficient and Resilient Buildings and Construction Sector.
32 Worldwide, buildings are not only responsible for around 40% of carbon emissions but also of 50% of all extracted materials, 33% of water consumption and 35% of waste generated – other environmental impacts include resource depletion, air, water and land pollution and biodiversity loss (Ecorys, 2014; Pomponi & Moncaster, 2016; Mercader-Moyano, Esquivias & Muntean, 2020).
33 Material Economics, 2019. The Circular Economy – a Powerful Force for Climate Mitigation.

Prevent

A building is heavily anchored in its context, which affects sustainability considerations. It is important for investors and financial institutions to understand that context. In Europe, with a large building stock, urban planning considerations, including the need for green, well-connected cities, are crucial to limit unsustainable real estate expansion.

The most straight-forward approach to avoiding embodied carbon from the outset is to consider alternative strategies, most prominently the renovation of existing buildings rather than new developments. Moreover, considerations of space efficiency over time through shared occupancy, flexibility and adaptability can prevent unsustainable real estate expansion.

Reduce and optimise materials use

From structural elements to finishes, building products often represent the biggest contribution. This is not just because these materials are used in such great volumes but because producing them is often highly carbon intensive. Therefore, it is crucial to evaluate design choices using a whole lifecycle approach and seek to minimise upfront carbon impacts such as through lean construction (which can be implemented straight away) as well as low carbon materials and construction processes.

More specifically, materials for the construction or retrofitting of buildings should source durable products and services (e.g. secondary, sustainably sourced, renewable, reusable and/or recyclable materials). Life-cycle assessment (LCA), life-cycle costing (LCC) and readily available digital information (such as building material passports) help to reduce and optimise material use[34].

Plan for the future

Take steps to avoid future embodied carbon during and at the end of a buildings' life, for example by maximising the potential for future renovations, future adaptation of a building's use, and enhancing the circularity of a building's materials. In the construction or renovation phase longevity, resilience, durability, easy maintenance and reparability of the building are essential. At the end of life, considerations of disassembly, reuse or recycling of embedded materials, components and systems are key[35].

Emissions from the use of buildings

In Europe, the operation (or use) of buildings alone accounts for 42% of all final energy consumption[36]. Improving energy efficiency of buildings, electrifying energy use and decarbonising electricity and heat are key to reducing emissions in Europe.

Reduce and optimise energy demand of new buildings

All new buildings should be built as decarbonised buildings – it avoids the need for retrofitting at a later stage. New buildings should be designed to minimise operational emissions from the start, ensuring they meet proposed ZEB standards and that they will require no future renovation work to improve their performance. Roughly 75% of the EU building stock is energy inefficient[37]. This means that a large part of the energy used goes to waste. Such energy loss can be minimised by improving existing buildings and striving for smart solutions and energy efficient materials when constructing new buildings.

34 WorldGBC, 2022. Circularity Accelerator.
35 WorldGBC, 2022. Circularity Accelerator.
36 European Environment Agency (EEA), 2020. Final energy consumption by fuel type and sector.
37 European Parliament, 2021. Draft Report on the implementation of the Energy Performance of Buildings Directive (2021/2077(INI)).

Plan for deep decarbonisation

About 35% of the EU's existing buildings are at least 50 years old, and at least 75% are not efficient enough to comply with future carbon reduction targets[38]. This reflects the need to set up action plans to remove any remaining sources of fossil fuels in buildings as soon as possible.

Key principles for the retrofitting of buildings are:

- When a building renovation occurs it should entail a deep energy retrofit – it avoids the need for another retrofit later on
- Deep energy retrofitting should become the default approach, representing the majority of works undertaken[39]
- The deep retrofitting rate should reach 3% per year as soon as possible before 2030 and be maintained up to 2050
- Those numbers stand in stark contrast with the current situation, where the average annual deep energy retrofitting rate in the EU is at 0.2%[40]

Source renewable energy

To achieve full decarbonisation, any remaining energy used needs to be carbon free. This is particularly challenging for space and water heating given that most heating is currently powered by gas, oil, or coal burned on-site.

On-site renewables can reduce stress on the power grid from additional demand. Wherever possible, new builds should incorporate on-site renewables. Energy from the grid should be supplied from zero carbon energy sources, acknowledging the overlap with the energy sector. Smart metres can also play a role in helping to integrate additional demand into a renewable energy-dominated grid[41].

38 World Green Building Council (WorldGBC), 2019. Bringing Embodied Carbon Upfront.
39 Building passports could give detailed guidance on what energy efficiency improvement measures are needed when retrofitting and be used for asset rating (WorldGBC, 2017).
40 BPIE, 2021. Deep Renovation: Shifting from exception to standard practice in EU Policy.
41 Climate Action Tracker, 2022. Decarbonising buildings: achieving zero carbon heating and cooling.

Join us

The urgency and complexity of financing the transition towards a fully decarbonised built environment calls for drastic actions. The built environment is of a fragmented and heterogenous nature rendering large-scale and timely financing of climate actions difficult. There are many signs of change, like recent and upcoming legislations bringing transparency and a common framework, and we need to avoid divergent implementation and reporting practices.

In that context, WorldGBC invites all stakeholders within the built environment, whether a financial institution, third-party reviewer, investor, developer, owner, manufacturer, architect, designer or consultant, and representatives of national government, states and cities, to be ahead of the transformation wave. We urge you to collaborate with our global network, powered by our Green Building Councils and our partners to ensure that Europe's built environment is decarbonised.

WorldGBC's new Sustainable Finance Taskforce convenes key stakeholders to enhance collective learning and progress, advises to build capacities amongst the industry and influences sustainable finance practices and policy implementation at a larger scale. We invite you to join us on this journey.

Appendix I

Non-exhaustive overview of resources on Whole Life Carbon and sustainable finance in the built environment

Key documents	Findings / Insights
WorldGBC Beyond the Business Case	▪ As the urgency of climate change is becoming clearer, sustainability is being integrated into every corner of the economy. ▪ Real estate is a major asset class accounting for 10% of global GDP. Therefore, the creation, renovation and maintenance of a sustainable built environment offers large scale financial opportunities, from both a market competitiveness and risk mitigation perspective. ▪ Financial markets are increasingly directing their investments towards projects and companies that guarantee (in addition to economic profitability) the achievement of social and environmental development goals.
WBCSD & OneClick LCA What investors and asset owners can do about embodied	▪ Reducing inefficient material use and wastage has a very direct financial benefit for construction management businesses. However, other players in the value chain do not directly share these benefits, so e.g. investors and designers have less incentive to design for material efficiency. ▪ Ideally, the incentives should be proportional to the effort. Calibrating the incentives is demanding and will in practice require simplified rules to allow project developers to target a specific performance level to unlock the incentive. ▪ Many of the incentives identified in this document work as part of a voluntary certification system by providing points. From decarbonization point of view, the optimal design for a voluntary certification design would be to make carbon reporting mandatory, and award points for better performance. Incentives with direct financial value linked to carbon reduction are rare.
Green Finance Institute Lender's handbook	▪ Energy efficiency measures and green home retrofit technologies are crucial to the transition to net-zero ready homes, as are the financial products and services which will facilitate their roll-out. ▪ Measurements assures and are unlikely to be justified purely on the basis of financial payback through energy bill savings.
WBCSD The business case for circular buildings: Exploring the economic, environmental and social value	▪ Life-cycle costing is currently the most widely used tool used by the industry to inform financial decision-making. However, when working with circular economy practices, almost a third of stakeholders when asked did not know how to create a monetary business case for circular performance. There is clearly a need to adapt conventional economic tools to be able to measure the retained value of a building in adopting.

Key documents	Findings / Insights
WorldGBC EU Policy Whole Life Carbon Roadmap	▪ The report provides an overview of key EU regulations and their timeline. ▪ The roadmap puts forward a multitude of policy recommendations from today to 2050.
DGNB, DK-GBC, GBCe, ÖGNI EU Taxonomy Study – Evaluating the market-readiness of the EU taxonomy criteria for buildings	▪ When comparing the different business activities related to buildings, newly constructed buildings scored highest in terms of Taxonomy eligibility and also had the least difficulty in demonstrating eligibility for the Do No Significant Harm (DNSH) criteria. ▪ The study found a strong correlation between eligibility and certification. Certified projects had a higher rate of eligibility in comparison with non-certified projects, both for the climate change mitigation and the Do No Significant Harm (DNSH) criteria.
DGNB, GBCe, DK-GBC, ÖGNI, D-GBC, SGNI, CGBC, BGBC, CPEA Evaluation of the market-readiness of the proposed Circular Economy EU-Taxonomy Screening Criteria for construction and real estate activities	▪ This intermediate project report aims to guide the transition of the criteria of the Taxonomy from a technical proposal into a functioning system at the very core of a future-proof, circular European economy. ▪ The study tested 31 projects, 30 covering the “New Construction” activity and one project covering the “Renovation” activity of the Taxonomy. Around 90% of the projects are (being) certified according to varying sustainable or green building standards, so a selection bias may accrue. ▪ The diverse group of market participants were unanimous in their motivation to gain a deeper understanding of the Circular Economy Taxonomy, as the topic is perceived as challenging despite the recognition that it is integral to sustainable sectoral economic activities. ▪ The current ambition of the Circular Economy screening criteria would lead to cherry picking, as achieving alignment to the first two environmental objectives are perceived as less challenging. To achieve wide application and realisation of the European circularity objectives, market participants claim the need for clearer description of scope and definitions.

Key documents	Findings / Insights
PCAF Guidance on financing the European building transition to net zero	▪ The report highlights challenges in financing a net-zero building stock ▪ It provides 3 key recommendations to the finance community: 1. Aggregation & Upscaling, 2. Data & Methodology, 3. Alignment & Vision ▪ It proposes a unified net-zero building definition ▪ It suggests a stepwise approach for financial institutions towards a net-zero building stock by 2050 ◦ Pathway towards net-zero buildings: a net-zero building stock by 2050 provides overall guidance for financial institutions to steer their strategies and actions ◦ Measuring and tracking progress along two key indicators: kgCO2e or tCO2e per square meter & kWh or MWh per square meter ◦ Decarbonization of building portfolios: Financed buildings of the portfolio need to be transformed on a large scale to EPC rating A to C to be aligned with the overall decarbonization pathway & 2030 and 2050 are key milestones (halve emissions 2030 and net zero by 2050) ◦ A “Menu of emission reduction measures” exists to decarbonise buildings: - Energy efficiency - RES - Embodied carbon - Efficiency in operation - (offsetting) ◦ Financing the transition through new financial products and services such as Building Renovation Plans, Green Home Finance Principles, a Lender’s Handbook on Green Home Retrofit and Technologies, Sustainability-linked Bonds/Loans, Green bonds/loans, Local Climate Bonds, Green Mortgages
Climate Action Tracker Decarbonising buildings: achieving zero carbon heating and cooling, Element Three – Financing	▪ In some cases, new or retrofitted zero carbon buildings are cheaper than more carbon-intensive alternatives, at least when considered over the lifetime of the building. ▪ In these cases, easy access to finance can reduce the perceived risk of high up-front costs and overcome financial barriers. However, where gas and heating oil remain cheap relative to the cost of electricity (when onsite renewables are not an option), and for more expensive upgrades, payback periods may be beyond an investor’s time horizon. ▪ Alternative financial support arrangements are required to change the market through improving the cost-competitiveness of low carbon investments, addressing high upfront costs, and reducing financial risks. Multiple policy instruments are available and the most appropriate depends on the regulatory framework and financial situation of the country or region. ▪ Carbon pricing has proven effective in encouraging electrification but ensuring that any money collected through a pricing instrument is redistributed, such that it does not exacerbate social inequalities, is crucial for a policy’s long-term viability.

Key documents	Findings / Insights
European Commission Level(s) European framework for sustainable buildings	▪ Level(s) provides a common language for assessing and reporting on the sustainability performance of buildings. It is a simple entry point for applying circular economy principles in the built environment. ▪ Level(s) offers an extensively tested system for measuring and supporting improvements, from design to end of life. It can be applied to residential buildings or offices. ▪ Level(s) uses core sustainability indicators to measure carbon, materials, water, health, comfort and climate change impacts throughout a building's full life cycle. It is a flexible solution for identifying sustainability hotspots and for future-proofing your project or portfolio.
EPRA EU Taxonomy Alignment in Listed Real Estate	▪ The Real Estate sector, given its high environmental impact, is in the spotlight of EU Regulations aimed at redirecting financial flows towards more environmentally sustainable investments, in order to achieve carbon neutrality by 2050 or other interim targets. ▪ Adding to the complex requirements of the EU Taxonomy, the differences observed in the interpretation of criteria to comply with the EU Taxonomy across European countries adds another level of complexity for organisations that operate in several markets, as they will have to calculate the EU Taxonomy eligibility and alignment of their investments using the approach or set of criteria defined in each specific country. ▪ In this context, and with other upcoming regulatory obligations (i.e. CSRD, Social Taxonomy) in the pipeline, organisations must remain in-tune with market practices and guidelines being published in order to continuously address the regulatory expectations at its highest level.

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