

Sustainable Buildings: Finance Reference Guide

*How-To Handbook for
Launching Sustainable Finance
for Real Estate Investments in
Emerging Markets*

Handbook

Ode Perdiges - Housing in Brazil



THREE NEO - Offices in the Philippines

About IFC

IFC — a member of the World Bank Group — is the largest global development institution focused on the private sector in emerging markets. We work in more than 100 countries, using our capital, expertise, and influence to create markets and opportunities in developing countries. In fiscal year 2025, IFC committed a record \$71.7 billion to private companies and financial institutions in developing countries, leveraging private sector solutions and mobilizing private capital to create a world free of poverty on a livable planet. For more information, visit www.ifc.org.

About GB-TAP

International Finance Corporation (IFC) Green Bond Technical Assistance Program (GB-TAP) aims to stimulate the supply of green bonds in emerging markets by creating and disseminating best practices and knowledge as global public goods. The GB-TAP is a multi-donor program managed by IFC and in partnership with the State Secretariat for Economic Affairs of Switzerland SECO; the Swedish International Development Cooperation Agency, SIDA; and the Ministry of Finance of Luxembourg. The program has two overarching goals: to facilitate capital flows from responsible investors in developed countries into green projects in emerging economies; and to grow markets by stimulating the demand for and supply of green bonds in emerging markets.

© 2025 International Finance Corporation.

All rights reserved.

2121 Pennsylvania Avenue, NW
Washington, DC 20433 USA

Internet: www.ifc.org

The material in this work is copyrighted. Copying and/or transmitting portions or all of this work without permission may be a violation of applicable law. IFC encourages the dissemination of its work and will normally grant permission to reproduce portions of the work promptly, and when the reproduction is for educational and non-commercial purposes, without a fee, subject to such attributions and notices as we may reasonably require.

IFC does not guarantee the accuracy, reliability, or completeness of the content included in this work, or for the conclusions or judgments described herein, and accepts no responsibility or liability for any omissions or errors (including, without limitation, typographical errors and technical errors) in the content whatsoever or for reliance thereon. The boundaries, colors, denominations, and other information shown on any map in this work do not imply any judgment on the part of the World Bank concerning the legal status of any territory or the endorsement or acceptance of such boundaries. The findings, interpretations, and conclusions expressed in this volume do not necessarily reflect the views of the Executive Directors of the World Bank or the governments they represent.

The contents of this work are intended for general informational purposes only and are not intended to constitute legal, securities, or investment advice, an opinion regarding the appropriateness of any investment, or a solicitation of any type. IFC or its affiliates may have an investment in, provide other advice or services to, or otherwise have a financial interest in, certain of the companies and parties (including those named herein). All other queries on rights and licenses, including subsidiary rights, should be addressed to IFC's Corporate Relations Department, 2121 Pennsylvania Avenue, NW, Washington, DC 20433 USA.

International Finance Corporation is an international organization established by Articles of Agreement among its member countries and a member of the World Bank Group. All names, logos, and trademarks are the property of IFC, and you may not use any of such materials for any purpose without the express written consent of IFC. Additionally, "International Finance Corporation" and "IFC" are registered trademarks of IFC and are protected under international law.



BluHomes - Housing in the Philippines

Sustainable Buildings: Finance Reference Guide

GB-TAP Green Bond Technical
Assistance Program

 **IFC** International
Finance Corporation
WORLD BANK GROUP
Creating Markets, Creating Opportunities

IN PARTNERSHIP WITH



Contents

Acknowledgements	8
Foreword	9
Executive Summary	10

Introduction: Sustainable Buildings through Five Case Studies

Chapter 1: The Global Real Estate Context	17
1.1 Unsustainable Pace of Construction	18
1.2 The Investment Potential for Sustainable Buildings	20
1.3 IFC's Experience with Sustainable Construction	24
1.4 The Real Estate Context Illustrated through the Case Studies	28
1.5 Chapter 1 Key Messages	31

Chapter 2: Sustainable Building Finance Taxonomies	33
2.1 Green building taxonomies	37
2.2 Resilient building taxonomies	45
2.3 Blue finance taxonomies	47
2.4 Circular economy taxonomy	50
2.5 Nature Finance and Nature-based Solutions	54
2.6 Carbon Markets	58
2.7 Sustainable-Linked Finance	59
2.8 Taxonomies Illustrated through Case Studies	61
2.9 Chapter 2 Key Messages	66

Chapter 3: Financial Value of Sustainable Buildings: Why the Investors Will Care

3.1 Investor Business Case Illustrated through Case Studies	73
3.2 Chapter 3 Key Messages	75

Chapter 4: Commercial Value of Sustainable Buildings: Why the Developers and Property Owners Will Care

4.1 Developers' and Property Owners' Business Case Illustrated through Case Studies	84
4.2 Chapter 4 Key Messages	86

Chapter 5: Steps to Create a Sustainability-Focused Real Estate Investment Program

5.1 Step 1: Raise Awareness and Identify Pipeline	89
5.2 Step 1: Illustrated through Case Studies	98
5.3 Step 2: Design Sustainability Approach	99
5.4 Step 2: Illustrated through Case Studies	105
5.5 Step 3: Deploy a Sustainability Expert	106
5.6 Step 3: Illustrated through Case Studies	107
5.7 Step 4: Rely on Certification as Proof of Compliance	108
5.8 Step 4: Illustrated through Case Studies	110
5.9 Step 5: Report Impacts	111
5.10 Step 5: Illustrated through Case Studies	114
5.11 Chapter 5 Key Messages	116

Chapter 6: Conclusion

References:	126
-------------------	-----

Figures

Figure 1: Sustainable bonds with green building Use-of-Proceeds

Figure 2: Global sustainable bond label issuance

Figure 3: Global sustainable bond issuance 2024: use-of-proceeds at point of issuance

Figure 4: Green Buildings are a US\$1.5 trillion incremental investment opportunity in the next decade

Figure 5: The growth in the space cooling market

Figure 6: IFC's Four-Part Approach to Sustainable Buildings

Figure 7: Green Building Market Growth in Colombia

Figure 8: Types of Sustainable Finance Instruments

Figure 9: Scope 1, 2, and 3 emissions

Figure 10: Steps to Issue a Green Bond or Green Loan

Figure 11: Main Taxonomies Related to Sustainable Buildings

Figure 12: Common Elements of Green Building Definitions

Figure 13: Certification Levels

Figure 14: Indicative Comparison of Select International and National Green Building Standards

Figure 15: Select Resilience Standards

Figure 16: Building Resilience Index Disclosure Framework

Figure 17: Blue Bond Issuance Values

Figure 18: Blue Bond Use-of-Proceeds

Figure 19: Blue Finance Categories

Figure 20: Circular Economy Activity Categories

Figure 21: Nature-Based Solutions

Figure 22: NEPI Rockcastle Use-of-Proceeds Green Framework

Figure 23: NEPI Rockcastle Sustainability-Linked Financing Framework

Figure 24: Asia Green Real Estate Sustainability Framework

Figure 25: Self-Built Home Green Eligibility

Figure 26: Absa Group's Green Building Finance Eligibility and Reporting

Figure 27: FIBRA Macquarie SLF key performance indicators

Figure 28: Drivers of Sustainable Building Adoption

Figure 29: Sustainable buildings offer a possibility for financial innovation and new products

Figure 30: Options for green mortgage financial innovation for a low-income household

Figure 31: Green buildings waterfall for a housing developer – perception

Figure 32: Reality – green buildings bring many benefits to developers

Figure 33: Perceptions of incremental green costs are much higher than the reality

Figure 34: Upfront costs vary but are always offset by an attractive payback period

Figure 35: The Benefits of Retrofitting Buildings

Figure 36: Five main steps to create a sustainability-focused real estate investment program

Figure 37: Sustainability-focused programs can connect the investors to new projects seeking funding

Figure 38: Green Analysis for the Project

Figure 39: Resilience Analysis

Figure 40: GRIP Program engagement

Figure 41: Scenario Modeling for Retrofits

Figure 42: Selected investor-led incentives for sustainable buildings

Figure 43: Select profile of banks offering incentives for sustainable construction in emerging markets

Figure 44: Sustainability certificates communicate value between investors, developer, and end users

Figure 45: IFC's CAFI tool helps investors track and report on their portfolio impacts

Figure 46: Financial Institutions have reported over 15 million sqm of certified floor space on CAFI

Case Studies

Figure 47: NEPI Rockcastle Reporting Framework	7	Circular Construction through Digitization – Madaster
1 BBVA, Peru	8	CEMEX
2 Implementation partnerships for sustainable buildings	9	Nature-Based Solutions in Buildings Case Study: Tu
3 ProCredit Bank, Europe		Berlin Adlershof, Institution of Physics (Berlin, Germany)
4 Fannie Mae –Leveraging Green Building Certifications	10	Nedbank, South Africa
for Multifamily Housing	11	FirstRand Bank, South Africa
5 Achieving Carbon Neutrality at the Net Zero	12	Banco Pichincha, Ecuador
McDonald’s	13	CIB Bank, Egypt
6 Mexico’s Vinte leading climate resilience in home	14	MAGC – Market Accelerator for Green Construction
construction	15	Green bond framework for Acorn, Kenya



Gravura Perdizes — Housing in Brazil

Acknowledgements

This Guide was prepared under the guidance of Diep Nguyen-Van Houtte, Manager of IFC's Green Buildings & Cities Program and Senior Manager in IFC's Climate Business Department, with support from Jamie Fergusson, Director of Climate Business. It was produced with generous contribution of funds by IFC's GB-TAP (Green Bond Technical Assistance Program), managed by Kaikham Onedamdy, Senior Operations Officer, under the supervision of Veronica Nyhan Jones, Manager of Climate Capacity and Inclusion Accelerator.

The lead authored is Rusmir Musić, Senior Operations Officer in IFC's Climate Business Department. The following IFC team members contributed specific chapters or their general expertise: in IFC's Climate Business Department: Ommid Saberi (Principal Industry Specialist), Michelle Farrell (Senior Operations Officer), Natalia Espinola Lopez (Extended Term Consultant), Jessica Stallings (Extended Term Consultant), and Beatrice Phillips (Operations Analyst); from IFC's Global Tourism, Retail, and Property Department: Alok Singh (Senior Industry Specialist) under the guidance of Shamsah Dhala (Manager); from IFC's Financial Intermediaries Group, Aishwarya Geete (Consultant, now with the Independent Evaluations Group) and William Beloe (Principal Industry Specialist) under the guidance of Laila Nordine (Senior Manager).

The lessons in this Guide are derived from the work of a veteran IFC Green Buildings team including Prashant Kapoor (innovator of EDGE), Ommid Saberi, Autif Sayyed, Nhan Nguyen, Diep Do, Lenore Cairncross, Kushinga Kambarami, Joel Briseno, Silvia Solano Quesada, and others. This Guide is dedicated to the loving memory of our colleague Dennis Quansah.

The lead author would like to extend particular thanks to peer reviewers: Anna Zicker (PEEB), Arista Dharsono (Asia Green Real Estate), Eleni Polychroniadu (Sintali), Juan Carlos Castro (FIBRA Macquarie), Juliette Jestin (AFD), Lina Maria Toro Osorio (Banco Davivienda), Paul Matthew (US Green Buildings Council), Ronald Hunziker (WBCSD), Simon Walley (World Bank).

Thanks also go to the following individuals who reviewed the key case studies: Arista Dharsono (Asia Green Real Estate), Juan Carlos Castro (FIBRA Macquarie), and Magdalena Gibney (NEPI Rockcastle).

Ben Smith and Guy Richardson from Environmental Finance led the team that edited and designed the report, under the supervision of Tony Gibson.

All images are courtesy of EDGE-certified projects.

Foreword

As the world continues to experience an unsustainable pace of construction, IFC has been working with visionaries around the globe showing that sustainable buildings are possible at scale, generating benefits for investors, developers, and users.

As you read this Guide, IFC is celebrating 10 years of our EDGE Green Buildings Market Transformation Program. In this decade of impact, we have been sharing key lessons learned through numerous webinars, journal articles, and conference participations, and our thought leadership publications such as “Green Buildings: A Finance and Policy Blueprint for Emerging Markets” (2019) and “Building Green: Sustainable Construction in Emerging Markets” (2023).

This Guide is a practical, how-to handbook for practitioners launching a sustainable finance program for real estate in emerging markets. This Guide is helpful for investors (banks, funds, and real estate investment trusts or REITs) but is also applicable to national and subnational governments wanting to engage in sustainable buildings and to institutional investors wanting stable returns from real estate green bonds in emerging markets.

The lessons learned collected here would not be possible without IFC’s partners who generously shared their experiences with others. We structured the Guide around case studies, with practical experiences across all aspects of real estate, from commercial to residential to industrial projects that bring strong return on investment while benefiting their end users.

As IFC begins a second decade of impact in our sustainable real estate program, we invite you to enhance your investment portfolio through green and resilient construction. Without you, the world will not be able to meet our collective climate change commitments. In the process, you will find attractive returns and potential to differentiate yourself with sustainability credentials.



Diep Nguyen-Van Houtte
Senior Manager
IFC Climate Business Department

Executive Summary

Global climate goals will not be achieved without a substantial emissions reduction in the construction sector and without substantial investments into building resilience. Construction generates about 37% of global carbon emissions, split between the production of construction materials (18%), building operations (34%), and on-site construction emissions. Two thirds of these emissions can be attributed to emerging markets, which is the area of focus for IFC as the development finance institution focused on private sector in emerging markets. This number will continue to grow as building booms in developing countries proceed through unsustainable construction. Approximately 1.2 billion people are at high risk from climate-related hazards, with the building sector in developing countries particularly at higher risk.

Investments in sustainable buildings in emerging markets remain low. Labeled sustainable finance issued with sustainable building use-of-proceeds totaled just over US\$450 billion in 2024. Of that number, only 5% of global sustainable finance was issued in emerging markets. Looking at sustainable bonds specifically, green buildings command only 16% of use-of-proceeds of green bonds in emerging markets, compared almost 40% penetration in industrialized countries.

This Guide aims to bridge this gap by providing a practical, detailed, step-by-step process on how to create an investment program focused on sustainable buildings. The

Guide is primarily targeted at financial institutions such as commercial banks, real estate funds, and REITs (real estate investment trusts). However, it has lessons learned for developers, owners, and managers of real estate, as well as construction companies and materials producers, with information on the business case and payback period for investments related to sustainable measures.

The Guide follows a case study-driven approach, illustrating the business case for sustainable buildings through numerous case studies of investors and developers who have benefited from sustainable construction. The Guide is primarily built on the experience of the International Finance Corporation (IFC), a member of the World Bank Group and the largest global development institution focused on the private sector in emerging markets. Given IFC's development mission, the case studies chosen are exclusive to emerging economies, but lessons learned can be applied to operations globally. The case studies include financial institutions (including banks, funds, and REITs) who have successfully launched a sustainable real estate investment program and are complemented by a number of examples of real sector projects in sustainable construction, covering residential, commercial, industrial, and healthcare sectors. Some examples are described in more detail as "boxes" and others are only quickly mentioned with links to deeper case studies. The Index at the back of the Guide shares more information on examples utilized.

In the Introduction, we meet the six case studies that will be used throughout the Guide to illustrate how different institutions across the globe have implemented the steps recommended in each chapter. These case studies were chosen to illustrate the variety of approaches in the types of

buildings and geographical contexts. The six case studies are:

- 1) Asia Green Real Estate – is a fully regulated asset manager specialized in sustainable real estate investments in Asia and also providing end-to-end sustainability services: from sustainability assessment, sustainability strategy and net zero map development, decarbonization strategy, and certification (such as GRESB and EDGE) to funds and building portfolio owners;
- 2) Aavas Financiers – a housing finance company providing loans for self-built housing in India;
- 3) Absa Group Limited – one of South Africa's largest financial services organisations, serving retail, business, and corporate clients;
- 4) NEPI Rockcastle – a developer of commercial buildings in Romania;
- 5) FIBRA Macquarie – a REIT (real estate investment trust) investing in and managing mainly industrial properties in Mexico;
- 6) Colombia – a country-focused case study showing how a combination of approaches can lead to catalyzation of sustainable construction and a market transformation.

Chapter 1 sets the context for the global real estate market, showing both the size of the challenge and the investment opportunity for sustainable construction, using green construction as the most relevant proxy for the total sustainable market. Green buildings represent a tremendous investment opportunity because real estate is the world's largest asset class. The total value of the world's property stood at US\$379.7 trillion at the end of 2022, more than four times greater than the combined annual GDP of the entire world. In the last few years, global private debt financing for building green increased twentyfold, from about US\$10 billion in 2017 to a record high of US\$230 billion in 2021. However, IFC estimates that only 10% of that issuance was in emerging markets. Just a small investment into greening construction value chains (estimated at 0.03% of the global GDP) could create a tremendous investment opportunity and a new asset class. Incremental investments in greening the buildings value chain could result in a

US\$1.5 trillion investment opportunity for emerging markets in the next decade. The most striking example of green market transformation through financial innovation is the country of Colombia, where over a quarter of new construction is now certified green.

In Chapter 2, the Guide looks at sustainable building finance taxonomies along the vectors of green construction, resilience, blue finance, circular economy, and nature-based solutions. While there are other aspects of sustainability, including gender, disability access, and economic inclusivity, this Guide focuses on the definition of sustainability that more narrowly tracks climate-related standards. The Guide also focuses on financial taxonomies, because the tie-in to finance and a strong business case that underpins action is the ultimate catalyst for change. In addition, the Guide also refers to international taxonomies, ensuring that projects looking for finance can appeal not only to local but also to international investors.

There are many reasons that banks, funds, and REITs are embracing sustainable buildings. Chapter 3 details the benefits to the investors, which include: enhanced ESG standing; lower investment risk; portfolio opportunity; brand recognition; new product offerings; increased market share; and simplified compliance. To the investors, the commercial value of sustainable buildings offers a possibility for financial innovation and new products. Both financial institutions and real sector companies are embracing labeled thematic bonds and loans to finance sustainable buildings. Green buildings have provided a clear avenue for many organizations to issue green bonds; so much so that the first green bonds in many countries (such as Colombia, Kenya, and Cote d'Ivoire) were actually earmarked for green buildings. There are particular benefits for the residential sector, as a specific case study of real estate built to sell. Data shows that green borrowers have lower default rate – on average 32% lower – leading to better portfolios for financial institutions. In India, IFC has even been scaling up an approach to finance green self-built housing.

Many developers believe that sustainable buildings do not make returns and only eat into their profit margin, but experience shows that investing in sustainable buildings makes multiple returns. Perception of cost remains much higher than the reality. Incremental costs vary according to building type and location, but always show an attractive return on investment (ROI). Incremental costs are returned in part through lowered energy bills, faster speed of sales, and from attracting more clients. In addition to new buildings, there are many benefits to retrofitting existing buildings in line with sustainable standards. Chapter 4 summarizes the six main drivers of green building adoption from the point of view of developers and asset owners:

- 1) Minimized incremental cost through early planning;
- 2) Faster sales, higher rents, and other benefits through market differentiation;
- 3) Savings on utility bills for owners and renters;
- 4) Lowered default rates for investors;
- 5) Fiscal or non-fiscal government incentives; and,
- 6) Access to international green finance flows for better financing terms.

Institutions looking to create a sustainability-focused real estate investment program can follow a journey of five key steps, described in detail in Chapter 5, including: 1) raise awareness and identify pipeline; 2) design green products; 3) deploy a technical expert for green assessment; 4) rely on

certification as a proof of compliance; and 5) report impacts. Some of these steps – such as awareness building – apply only to investors who have to build a rapport with their developer clients; the rest of the steps are applicable across the spectrum of both real sectors and financial institutions.

Impacts need to be reported in line with harmonized guidelines for sustainability finance, which Step 5 in Chapter 5 describes. IFC's tools can help institutions complete the reporting process and also navigate more easily the process for a green bond issuance for sustainable buildings. Institutions who have followed the previous steps of creating an investment program will easily align with the four core components of the Green Bond Principles: 1) Use-of-proceeds, 2) Process for Project Evaluation and Selection, 3) Management of Proceeds, and 4) Reporting.

The main message of the Guide is that institutions can in fact create a substantial climate investment portfolio through real estate investments, including through green and blue bonds, circular economy and nature-based solutions. Emerging markets currently trail behind industrialized countries in using real estate for sustainable use-of-proceeds – a gap we hope to close. Ultimately, sustainable buildings have documented benefits to investors, building developers and owners. Sustainable buildings provide an opportunity for a triple bottom line benefit: people, planet, and profits.



Introduction: Sustainable Buildings through Six Case Studies

The buildings sector is complex, with asymmetry of information between builders, buyers, and investors. The key to catalyzing the market is to address each party's concerns and to present financial, social, and environmental benefits that can be reaped by each player in the sustainable construction ecosystem. To that end, in addition to many smaller case studies presented throughout, this Guide will focus on six “master” case studies to illustrate value creation in the construction value chain.



Asia Green Real Estate is a fully regulated asset manager specialized in sustainable real estate investments in Asia. With offices in Asia and Europe, the team optimally combines local execution skills with an international perspective, strong investment discipline, and highest governance standards. The local presence and the long-standing partner network allow direct access to first-class investment opportunities in Asia's leading metropolises. Through their comprehensive investment platform investors directly participate in Asia's economic growth and benefit from an enhanced portfolio diversification. Asia Green Real Estate is committed to certifying every building with appropriate green building standards. The company recently celebrated the first net zero carbon high-rise complex in Indonesia.



Aavas Financiers is an affordable housing finance company, primarily serving low and middle-income self-employed customers in semi-urban and rural areas in India. Aavas provides affordable [home loans](#) in the un-served market and most of its customers have limited access to formal banking credit. Aavas piloted the green certification for self-built housing.



Absa is a diversified financial services provider headquartered in Johannesburg, South Africa. In 2020, Absa launched the [Absa Eco Home Loan](#) – a first of its kind green mortgage in South Africa. This product resulted from a partnership with Balwin Properties, an early market mover and champion of green construction. To demonstrate its commitment, Balwin had the largest EDGE certification registration in the world – committing 25,000 units for certification in 2019. Absa provided a rate concession on customer's interest rate to incentivise customers who purchase a property in an EDGE-certified development under the Absa Eco Home Loan product. This successful partnership then enabled IFC to deploy a US\$236 million green credit line to Absa to support green construction and mortgages including commercial construction). Through a Performance Based Incentive (PBI), Absa was able to

enhance its Absa Eco Home Loan further by adding a rebate feature. End users can get a portion of their loan amount paid back into their home loan account as the EDGE certification is finalised. IFC also invested US\$58 million directly into Balwin, helping the developer build more than 16,000 houses for low- and middle-income buyers near Johannesburg.

NEPI ROCKCASTLE

NEPI Rockcastle is an owner and operator of commercial real estate in Central and Eastern Europe, with presence in eight countries and investment property value of 7.9 billion euros across 57 retail properties (as of December 2024). The Group first launched its Green Finance Framework in 2020. Capital markets issuances in the green format ensures additional transparency for debt investors on the use and impact of funds. The objective of green labelled funding issued under the framework is to support NEPI Rockcastle's transition towards more sustainable real estate, in line with one of the Company's strategic pillars "Invest in healthy and sustainable buildings."

MACQUARIE

FIBRA Macquarie focuses on the acquisition, ownership, leasing and management of industrial and retail real estate properties in Mexico. Set up as a real estate investment trust (REIT), FIBRA Macquarie has 260 industrial and retail properties across 20 cities in Mexico, totaling US\$3.4 billion in asset value. In 2024, IFC provided a US\$150 million sustainability-linked loan and technical assistance to FIBRA Macquarie México for the development of new green industrial parks in Mexico, which includes the development of new green industrial parks in Mexico City, Monterrey, Ciudad Juárez, Guadalajara and Tijuana. It also includes energy efficiency upgrades of existing properties supported by IFC's GRIP decarbonization program. The investment was

part of IFC's commitment to promote greater sustainability in Mexico's real estate sector, especially in the industrial assets sector, a key area to take advantage of the historic opportunity represented by nearshoring.



Colombia is a case study of collaboration between public and private sector actors to catalyze green construction. The green building market grew incredibly quickly from very low penetration to cornering over 25% of all new construction with 20 million m² of space certified as of March 2025 as per EDGE program data.¹ Initially, two commercial banks – Bancolombia and Davivienda – launched green investment programs supported by green capital market issuances. This list now includes a total of six banks, with the addition of BBVA, Banco de Bogota, Banco de Occidente, and Banco Caja Social. At the same time, the government introduced tax incentives for technical solutions such as insulation and energy-efficient air conditioning systems. IFC launched the green certification program in partnership with CAMACOL, the Colombian Chamber of Construction, with the technical know-how of international certifiers. Colombia is now the number one country in the world in real estate space certified with EDGE. The success was celebrated with the President of Colombia in the lead up to UN COP26 held in Glasgow in 2021, as an example that incredible market transformation is possible through financial markets and partnerships.

At the end of each Chapter, the Guide will illustrate how each of the "master" case studies tackled the particular topic at hand, thus showing the entire sustainability journey from start to finish. Each chapter will also end with a "so what" key messages for investors, developers, and construction companies.

¹ Menes (2019).



Óptima Centro de Negocios – Offices in Guatemala

1

The Global Real Estate Context



1.1 Unsustainable Pace of Construction

Global climate goals will not be achieved without a substantial emissions reduction in the construction sector. Construction generates about 37% of global carbon emissions, split between the production of construction materials (18%), building operations (34%), and on-site construction emissions.² Two-thirds of these emissions can be attributed to emerging markets, a number that will continue to grow as building booms in developing countries proceed through unsustainable construction. According to the Global Alliance for Buildings and Construction, half of the buildings standing in 2050 have not yet been built. The equivalent of Paris is added in floor space every 5 days³ and that of India every year until 2060.⁴

According to the United Nations Environment Programme (UNEP), embodied emissions are projected to represent nearly half of total building-related emissions by 2050, as operational efficiencies improve.⁵ Cement, steel, and aluminum remain the most carbon-intensive materials, yet continue to dominate new construction.⁶ Using alternative fuel sources such as biomass, waste, and industrial residues, combined with wind and solar renewable energies rather than coal, can reduce emissions from cement production by 20%.⁷ Taking energy and resource efficiency measures can save up to 30% in electricity needs. In the steelmaking industry, injecting pure oxygen into blast furnaces uses less coal and can lower emissions by 15 to 20%.⁸

Approximately 1.2 billion people are at high risk from climate-related hazards, with the construction sector in developing countries particularly at higher risk.

The World Bank's flagship report, "Rising to the Challenge," emphasizes that mitigating climate and disaster impacts necessitates a combination of accelerated development, more resilient infrastructure, and targeted adaptation interventions.⁹ Investing in resilient infrastructure is crucial for safeguarding lives and promoting sustainable development. The net benefit of building more resilient infrastructure in low- and middle-income countries would be US\$4.2 trillion, with US\$4 in benefit for each US\$1 invested. Continuing with current practices over the next decade could cost US\$1 trillion more due to climate change and infrastructure investments.

The management of Environmental, Social, and Governance (ESG) strategies, risks, and disclosures is essential for the sustainable, long-term success of companies and private investments. Subpar ESG practices lead to external costs impacting business operations, the environment, and society, which can harm companies' reputations. Consequently, this results in diminished investor confidence and criticism from civil society and other stakeholders. These disclosures provide a platform for companies to highlight their initiatives, progress, and future goals, showcasing their commitment to responsible and sustainable business practices. In real

² Global Alliance for Buildings and Construction (2025).

³ Global Alliance for Buildings and Construction (2025).

⁴ Global Alliance for Buildings and Construction (2025).

⁵ UNEP (2023).

⁶ UNEP (2023).

⁷ IFC (2023).

⁸ IFC (2023).

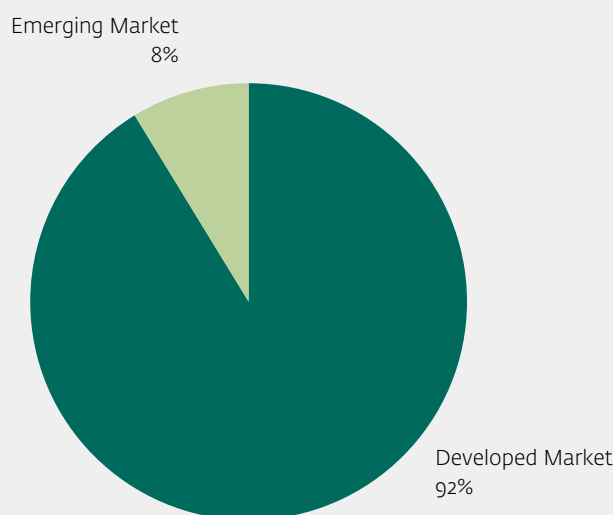
⁹ World Bank (2024).

estate, ESG reports demonstrate portfolio eligibility for green finance, enhancing investor interest and trust. Standards like EDGE, LEED, and BREEAM align with frameworks such as Climate Bond Initiative and ICMA's principles, supporting the deployment of the finance needed to achieve environmental targets like climate change mitigation and pollution control, and demonstrating that global best practices have been followed. The global growth of green bonds reflects the value and risk mitigation potential of ESG factors. Reporting standards like ISSB/IFRS S2, ESRS, and GRI guide emerging markets in climate-related disclosures, accountability, and managing risks. This attracts investors, ensures compliance, and fosters sustainable practices for better financial performance and resilience.

Despite many pressures to change construction practices, and many benefits from doing so, investments in sustainable buildings in emerging markets remain low. Labeled sustainable finance issued with sustainable building use-of-proceeds totaled just over US\$450 billion in 2024. Of that number, only 5% of global sustainable finance was issued in emerging markets.¹⁰ Looking at sustainable bonds specifically, green buildings command only 16% of use-of-proceeds of green bonds in emerging markets, compared with almost 40% penetration in industrialized countries.¹¹ On the other hand, experience shows that many banks hold around 20% of their investment portfolio in real estate. This disconnect between the green building experience between industrialized and emerging markets, and the disconnect between portfolio numbers for green finance and overall portfolio, shows that many banks are essentially “leaving money on the table.”

FIG 1

Sustainable bonds with green building use-of-proceeds



¹⁰ IFC 2023).

¹¹ Environmental Finance Data – 14/04/2025.



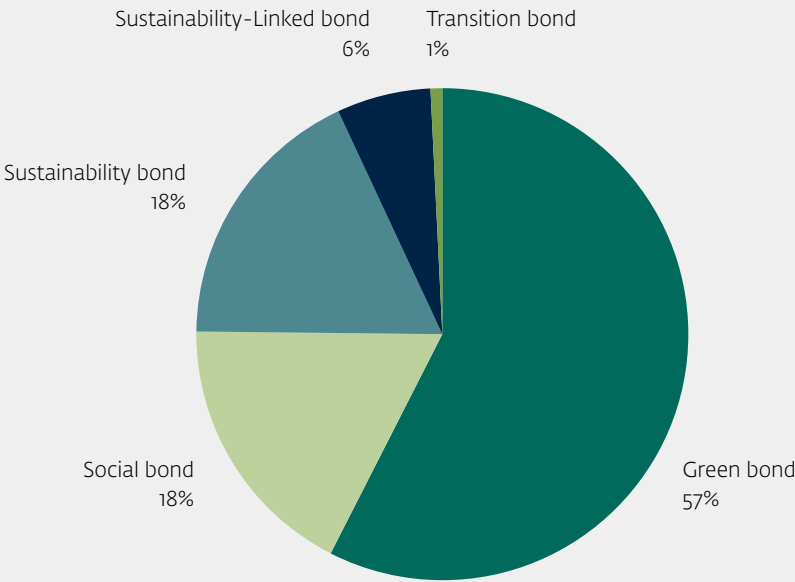
1.2 The Investment Potential for Sustainable Buildings

While this finance reference guide covers the spectrum of sustainable buildings, the market for green buildings is the most well understood. Blue finance, circular economy, resilience, and nature-based solutions are fairly new technical and financial concepts and are further described in Chapter 2 focusing on taxonomies. In contrast, green finance has existed for some time. As can be seen in Figure 2, the majority of the sustainable bond label issuance has been for green bonds. As a result, market sizing calculations are more mature for the green building sub-sector. IFC has shared the most recent market sizing information in our flagship report “Building

Green: Sustainable Construction in Emerging Markets.”¹² In addition, we have looked into investment opportunities for sustainable cooling specific to the built environment, which were shared in the report “Cooler Finance: Mobilizing Investment for the Developing World’s Sustainable Cooling Needs.”¹³

Green buildings represent a tremendous investment opportunity because real estate is the world’s largest asset class. The total value of the world’s property stood at US\$379.7 trillion at the end of 2022, more than four times greater than the combined annual GDP of the entire

FIG 2
Global sustainable bond label issuance

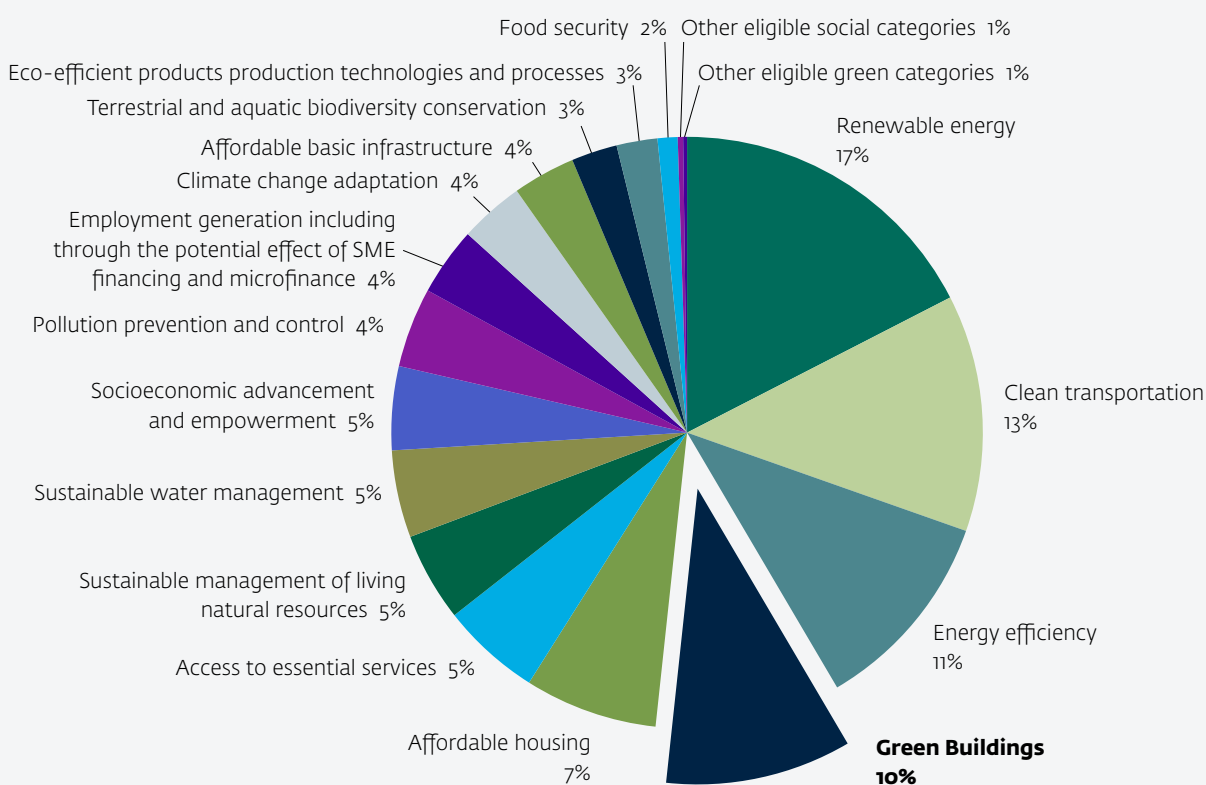


¹² IFC (2023).

¹³ IFC (2024).

FIG 3

Global sustainable bond issuance 2024: use-of-proceeds at point of issuance



world.¹⁴ In the last few years, global private debt financing for building green increased twentyfold, from about US\$10 billion in 2017 to a record high of US\$230 billion in 2021. However, IFC estimates that only 10% of that issuance was in emerging markets.¹⁵ This is evident in Figure 3 which shows that only 10% of sustainable bonds issuance was earmarked for green buildings. According to Figure 1, over 90% of these investments came from industrialized countries, with emerging markets contributing only 10% of the total. Just a small investment into greening the

construction value chains (estimated at 0.03% of the global GDP) could create a tremendous investment opportunity and a new asset class.

Incremental investments in greening the buildings value chain could result in US\$1.5 trillion investment opportunity for emerging markets in the next decade.

As seen in Figure 4, IFC's report "Building Green: Sustainable Construction in Emerging Markets" estimates the investment needs to green the construction sector at US\$1.5

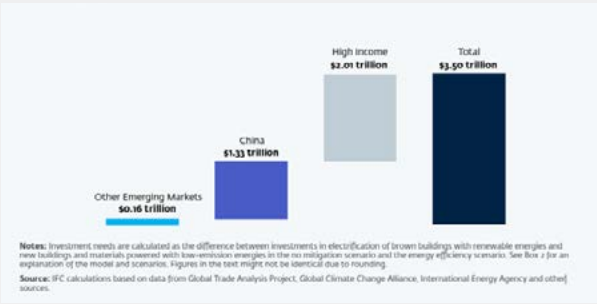
¹⁴ Tostevin and Rushton (2023).

¹⁵ IFC (2023).

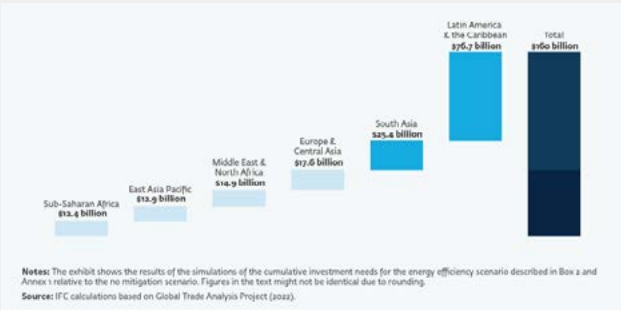
FIG 4

Green buildings are a US\$1.5 trillion incremental investment opportunity in the next decade

Investment Needs for Building Green Will Amount to \$1.5 Trillion in Emerging Markets in the Next Decade



A Third of the Investment Needs in Emerging Economies Outside China Would Be in Latin America and the Caribbean and South Asia



trillion in emerging markets over the next decade.¹⁶ While China, where the construction industry continues to boom, commands a large portion of this number, other emerging market countries represent a US\$160 billion investment opportunity.

Sustainable cooling for green real estate (i.e. space cooling) is expected to triple by 2050. One specific aspect of green buildings is the need for sustainable space cooling. Due to increasing temperatures globally, combined with urbanization and economic growth, the market for sustainable cooling in real estate is also expected to grow. This market includes traditional cooling measures, such as ceiling fans and air conditioners, and more innovative business models, such as district cooling and cooling-as-a-service. As seen in the report jointly written by IFC and UNEP “Cooler Finance: Mobilizing Investment for the Developing World’s Sustainable Cooling Needs”¹⁷ and displayed in Figure 5, cooling growth in real estate is driving the entire market. Space cooling is expected to triple to a

FIG 5

The growth in the space cooling market

Space Cooling Will Drive Cooling Demand, Underlined by Urbanization and Economic Growth

Estimated growth of active cooling market in developing countries by 2050 (\$ Billion)



Source: Global Cooling Emissions and Investment Model

¹⁶ IFC (2023).
¹⁷ IFC (2024).

US\$332 billion investment opportunity per year. The market in Africa is expected to grow seven times, while the market in South Asia will grow 4 times.¹⁸ IFC's Sustainable Cooling Initiative helps projects include sustainable cooling into their design and implementation.¹⁹ The Initiative is a "five by five" strategy that addresses five sectors where cooling is needed most through five modes of engagement (in addition to cooling for green buildings, the initiative works with agribusiness, manufacturing, and infrastructure providers).

While this Guide focuses on private sector finance, the right enabling environment through public sector action can further catalyze the market.

Governments may adopt a variety of both fiscal and non-fiscal incentives to stimulate green building growth. These incentives can positively affect job creation and reduce air pollution while helping fulfill contributions to sustainability and greenhouse gas reduction goals, especially as part of countries' Nationally Determined Contributions (NDCs) and the Paris Climate Agreement process. Fiscal incentives may include tax benefits (exemptions or deductions), green mortgages (preferential interest rates for green homes),

direct subsidies (payments for sustainable upgrades such as solar panel installation), or permit fee reductions (lowered building or infrastructure fees). The Global Alliance for Buildings and Construction has mapped out some key examples of fiscal stimulus programs from both emerging and industrialized economies.²⁰ Non-fiscal incentives are particularly attractive, as they do not cost the public sector precious budgets, but still offer incentives that developers and financial institutions can monetize. Examples include increased building area (height or density bonuses), faster permits (expedited approvals), or flexible regulations (relaxed zoning or design rules). IFC has been mapping out examples of possible interventions as well as countries who are already implementing fiscal and non-fiscal incentives.²¹ In addition, IFC has collected experiences from working with local municipalities into a "Municipal Toolkit for the Public Sector."²² Cases such as the ordinance of the District Municipality of San Borja in the city of Lima which resulted in 85% of projects within the district to be green buildings, or the district of Miraflores with a share of 72% green buildings, underscore the impact municipal incentives can have on catalyzing the local market.

¹⁸ IFC (2024).

¹⁹ See [IFC's Sustainable Cooling Initiative website](#)

²⁰ See [GlobalABC website](#).

²¹ See [EDGE website for Governments](#).

²² See [Municipal Toolkit for the Public Sector website](#)



1.3 IFC’s Experience with Sustainable Construction

IFC’s experience with its own investments and through financial institutions shows that real estate could be a substantial area of climate finance for investors and developers in emerging markets. At the end of fiscal year 2025, IFC’s green building cumulative investments in the period of 2005-2025, combining IFC’s own account investments and mobilization, totaled over US\$19.4 billion. Out of that number, over US\$6.6 billion was investments through local financial institutions. As seen in Figure 2, IFC has a four-part approach to sustainable buildings, which includes:

- Public policy and enabling environment: supporting financial and building sector public policy makers and aiding in technical capacity building;
- Investment and advisory for the building sector: helping project sponsors design and fund green and resilient projects;
- Investment and advisory for financial intermediaries: helping local banks increase green and resilient building portfolios by launching new products and raising green finance; and,
- EDGE Certification and the Building Resilience Index: thought leadership on affordable and shared definition

FIG 6
IFC’s Four-Part Approach to Sustainable Buildings



for a path to zero carbon and resilient buildings for all industry stakeholders.

The EDGE Green Buildings Program is one of the fastest growing green building certification systems in the world. As of July 2025, EDGE has enabled the investment into and certification of over US\$100 billion in green real estate.²³

IFC has deployed various sustainable finance instruments for real estate with both banks and real sector companies. Some case studies, which will be further elaborated in the paper, include:

- Green bond: US\$100 million investment in Commercial Investment Bank (CIB) to develop Egypt's commercial real estate market;
- Green senior debt: US\$250 million investment in the bank BBVA Peru for green mortgages;
- Green loan: US\$250 million to FirstRand Bank in South Africa to fund green building construction and residential mortgages, with targets for affordable housing and women;
- Self-built homes: US\$100 million investment in IIFL, India for green affordable self-built housing;
- REITs: €750 million facility to WDP in Romania, issued as a green loan.

IFC's green building investments through local financial institutions span the commercial and residential sector, and span investments into both supply and demand, that is both construction and mortgages. IFC's experience in this sector is also based on working with partners from across the globe, including the Global Alliance for Buildings and Construction, UNEP and Cool Coalition, many local Green Building Councils, architecture firms, and many more.

In addition to investing through local banks, IFC also works with other types of financial institutions such as funds and REITs (real estate investment trusts).

CASE STUDY 1

BBVA, Peru



IFC's US\$60 million loan in 2021 to BBVA Peru is helping the country's underdeveloped green mortgage market by targeting the demand side of the housing supply: green mortgages. This was followed by a second investment of US\$250 million senior debt for strengthening the bank's green buildings product. Normally, banks working on green mortgages must first ensure the creation of the green housing stock. In the case of Peru, the stock had been successfully created by a public policy program by local municipalities that incentivized developers to build green. The additional height bonus is a non-fiscal incentive that still benefited the developers but did not cost the local governments their precious budget. Once the supply was there, the Bank could finance the supply. For more information, refer to the [BBVA article](#).

IFC engages funds and REITs in a variety of ways, including through investments and technical advisory to the investors and their developer clients. REITs are companies that own, operate, or finance income-producing real estate, allowing investors to participate in real estate without directly owning properties, often offering dividends and capital appreciation. One successful program targeting REITs and other large owners of real estate is GRIP: Greening Real Estate Investment Portfolios.²⁴ Designed to advise and

²³ EDGE Buildings website.

²⁴ [GRIP website](#).

finance climate commitments at scale, GRIP empowers new and existing IFC clients to establish or enhance their decarbonization strategies across their portfolios. GRIP is a comprehensive advisory and investment package, and blends IFC's unique real estate decarbonization expertise with the latest climate finance products.

IFC can also deploy thematic advisory to green buildings through our Eco-Industrial Parks Program and the Sustainable Cooling Initiative. Buildings in most emerging economies function in very hot environments, where 40–50% of the energy footprint could go to cooling. Space cooling – that is, addressing the cooling needs of residential and commercial buildings – represents over half of the projected US\$600 million annual cooling market by 2050.²⁵ At the same time, countries and businesses globally are committing to reducing the emissions from cooling through the mechanism of the Global Cooling Pledge convened by UNEP through the Cool Coalition.²⁶ Because of this, cooling for green buildings is one of the five focus areas for IFC's Sustainable Cooling Initiative.²⁷ Working through existing IFC initiatives like EDGE and GRIP, the Cooling Initiative provides an additional layer of technical assistance to incorporate passive cooling solutions, more efficient cooling technologies, introduction of refrigerants with lower GWP (global warming potential), and to bring cooling as adaptation to rising heat. The Eco-Industrial Parks (EIP) initiative is another of IFC's solutions to the market, answering the need of assets that drive economies but are resource and carbon intensive. The EIP certification is under development and will investigate how parks can function as a whole, not just as a collection of assets, with the view on infrastructure services, and green and social aspects of the park operation.

Experience from other development finance institutions like the EBRD offers insight into how to bridge the green building financing gap. Since launching

its Green Economy Transition (GET) approach in 2015, the EBRD has mobilized over €15 billion in green building investments, including €2 billion of its own financing. Through over 200 projects and the refurbishment or development of 62,000 buildings, the EBRD has helped save 71,000 GWh of energy and avoided 335 million tonnes of CO₂ emissions. These investments span commercial, residential, and public buildings, with interventions ranging

CASE STUDY 2

Implementation partnerships for sustainable buildings



There are many programs for sustainable buildings, implemented globally, regionally, or nationally. The Global Alliance for Buildings and Construction²⁸, hosted by UNEP, is the common global platform for all buildings stakeholders committed to a common vision: A zero-emission, efficient and resilient buildings and construction sector. The GlobalABC is an advocate and catalyst for action, platform to set targets and track progress, and a support mechanism for both countries and the private sector for implementation. The Partnership for Energy Efficiency in Buildings (PEEB)²⁹ is implemented in partnership with 21 countries committed to advancing sustainable building and construction practices. PEEB collaborates with partner governments and industry stakeholders on all levels, from single building projects to the broader policy environment.

²⁵ IFC (2024).

²⁶ Cool Coalition website.

²⁷ IFC's Sustainable Cooling Initiative website.

²⁸ See the [Global Alliance for Buildings and Construction website](#).

²⁹ See the [PEEB website](#).

from small-scale efficiency upgrades to complex, structured finance projects exceeding €100 million. EBRD also works through local financial institutions via its Green Energy Finance Facilities (GEFFs), which provide credit lines and advisory services for energy-efficient construction and retrofitting. To date, GEFFs have reached over 60,000 building refurbishments. Structured finance products have similarly enabled ESCOs and other aggregators to deliver deep renovations while ensuring financial viability for homeowners and public building managers. By integrating capital investment, market development, and regulatory alignment, the EBRD demonstrates that emerging markets can move swiftly toward a green building future – if the right instruments and support systems are in place.

Elsewhere, in the private sector, Fannie Mae's Green Financing programs support multifamily property owners in improving energy and water efficiency while benefiting from financial incentives. Key offerings include Green Rewards, which provides up to 5% additional loan proceeds and lower interest rates for properties that commit to at least 30% energy or water savings, and Green Building Certification pricing discounts for properties with recognized certifications such as LEED, ENERGY STAR®, or Passive House, awarded within the last five years. The Green Preservation Plus program offers enhanced terms for affordable housing undergoing green upgrades. These programs often include a free High Performance Building Report and require annual energy/water usage reporting through Bright Power, while loans can be securitized as Green Mortgage-Backed Securities (Green MBS) to attract sustainability-focused investors.



1.4 The Real Estate Context Illustrated through the Case Studies



Asia Green Real Estate strategically chose Asia for its investments fueled by the belief that investors should consider directing their funds toward Asia. In Asia Green's countries of focus, sustainable

buildings have a very low penetration according to IFC's research into green building market maturity assessment:³⁰

- 1) In Indonesia, certified new green buildings were 2% of the total construction market as of 2020, with a majority of certified buildings in the office sector. Banks provide financing for green buildings but at limited scale. The market was deemed underdeveloped but strengthening.
- 2) As of 2019, the Philippines were an underdeveloped but dynamic Green Building market. The certified Green Building market penetration was about 3% in 2019. Introduction of green policies in the construction and finance sectors reflect the country's determination to pursue sustainable development, with at least eight banks providing green finance for construction.
- 3) As of 2020, China's Green Building market was more advanced than other emerging countries. The current market development is very much government driven. The government includes green buildings as part of the country's national development plans, has had ambitious green building targets, provides incentives for new green building developments or renovations of buildings for energy efficiency, and requires all public buildings to be certified green. At the end of 2019, buildings rated by the

government's green certification system, Green Building Label (GBL), represented 65% of the newly constructed urban buildings, with around 2% of new builds certified by international certification systems in 2020. In contrast to widespread adoption of the national Green Building rating system in the country, Green Building financing is less advanced. While several green bonds have been issued and a few big banks support Green Building projects, Green Building finance products have not been common.

While many would see a challenge, Asia Green sees these trends as an investment opportunity. According to their website, Asia Green focuses on Asia as global economic growth engine, responsible for over a third of world GDP, with the possibility for portfolio diversification in light of global and economic uncertainties. Real estate is a particularly attractive area for investments as it offers rental income growth alongside economic expansion, high correlation between real estate prices and GDP growth, with megatrends – such as ongoing urbanization and a fast-growing middle class – driving demand for real estate.



Aavas operates in India, where the green building market is underdeveloped. Certified floor

space represents about 2% of formal new built area. Green buildings have traditionally been limited to commercial and high-end residential buildings. In terms of financing, green

³⁰ IFC (2023b).

finance forms only a sliver of India's financial institution portfolios and is generally not reported by financial institutions separately. Several Indian states' green building policies and incentives, and investors' increased interest in green buildings, likely provide a push for the development of the green building market.³¹ At the same time, the need for housing in India is tremendous. India's urban population will grow by 127 million from 2020 to 2030, the equivalent of adding the entire population of Egypt or Vietnam. 62% of new housing in India is still self-built, usually without any architect or developer being involved. Aavas saw a tremendous opportunity for these homes to be built in a more resilient and environmentally-efficient manner and partnered with IFC to pilot the green self-built housing program.



While **Absa** operates in many countries, its base of operations is in South Africa. As of 2020, South Africa's green building market was moderately developed. According to the MAGC Green Building Market Maturity

Assessments, the country's certified floor space was relatively high, around 30% in 2020. However, most of the certified buildings consisted of large scale higher-end commercial offices and residential buildings, with low penetration in the affordable housing sector. Overall climate financing is still limited, representing approximately 2% of total lending for the top three banks assessed by IFC.



NEPI Rockcastle operates in Central and Eastern Europe, in an environment where ESG concerns are increasingly recognized and regulations are evolving to address sustainability and climate-related issues. As part of

its sustainability strategy, the Company performed a comprehensive analysis of climate-related risks and opportunities for its portfolio, grounded in the recommendations of the Task Force on Climate-Related Financial Disclosures (TCFD).³² The Group analyzed both physical climate risks (impacts from effects of climate change such as storms and droughts) and transition risk (risk of stranded assets due to stronger policy regulation, energy prices, market valuation, and insurability). These risks have been turned into opportunities through a Green Finance Framework which attracted €1 billion in green bonds. In addition, NEPI Rockcastle has established a robust Sustainability-Linked Financing Framework (SLFF) to guide its future funding initiatives. This framework incorporates Key Performance Indicators (KPIs) and Sustainability Performance Targets (SPTs) that are linked to company operations and attracting €795 million in finance from development and commercial finance institutions.



MACQUARIE **FIBRA Macquarie** operates in Mexico, where green building construction

and finance were underdeveloped but gradually growing.³³ The certified green building market penetration was around 5% and certified buildings were mainly in the non-residential sector in 2020. Mexico was experiencing significant industrial growth as a result of nearshoring and access to the North American markets. Strong market demand in certain sectors was driving investment flows into light manufacturing, logistics, and other sectors benefiting industrial real estate. Rather than simply competing on the basis of a cheaper labor force, Mexico's industrial sector is differentiating itself through sustainability credentials.

³¹ IFC (2023b).

³² NEPI Rockcastle (2023).

³³ IFC (2023b).



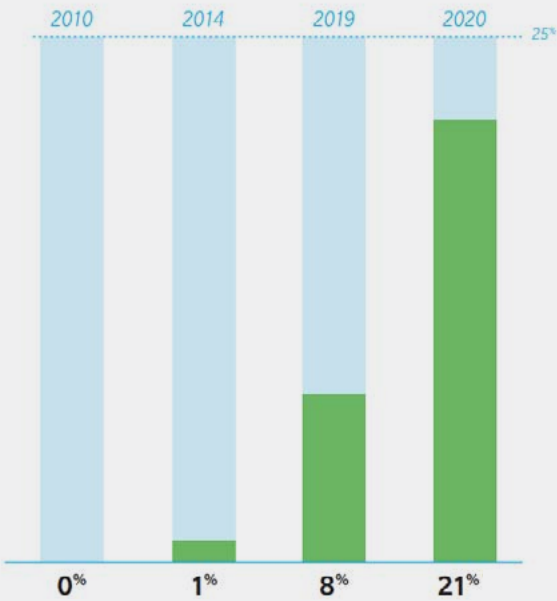
Colombia has been one of the fastest growing certified Green Building markets and the leader among emerging economies with its green building market penetration. While

there were a handful of certified buildings in the country in the mid-2010s, the overall market penetration of certified green buildings in Colombia rose to 8% of all formal newly built-in space in 2019 and represents a quarter of all new buildings, with EDGE-certified green space reaching 20 million m² in 2025 as per EDGE program data. The green building market boom in Colombia can be attributed to its strong enabling environment, activities of the financial institutions, and the contribution of CAMACOL as a key actor in the promotion and training of sustainable construction in the country, in coordination with public and private entities. Several green bonds have been earmarked to buildings and the majority of the top banks in Colombia are providing preferential financing packages for green loans.

FIG 7

Green Building Market Growth in Colombia

Share of certified new green buildings among all new developments (based on square meters)





1.5 Chapter 1 Key Messages

- Climate mitigation and climate resilience and adaptation are both needed to make the construction sector more sustainable and to ensure long-lived resilient assets.
- Management of ESG strategies is increasingly important for company operations, fuelled by both policy pressures and market expectations.
- Both these pressures can be turned into investment opportunities to green the world's largest asset class: real estate. Incremental investment into green buildings in emerging markets could result in a US\$1.5 trillion investment opportunity in the next decade.
- Emerging markets are "leaving money on the table" when it comes to sustainable real estate. Only about 10% of global financing for sustainable construction is flowing through emerging markets, the rest being cornered by developed countries.



Eco Alcala – Housing in Peru

2

Sustainable Building Finance Taxonomies

Investors and companies looking to launch a sustainable buildings finance program can utilize two related sustainable finance instruments: “use-of-proceeds” and “target-driven.”

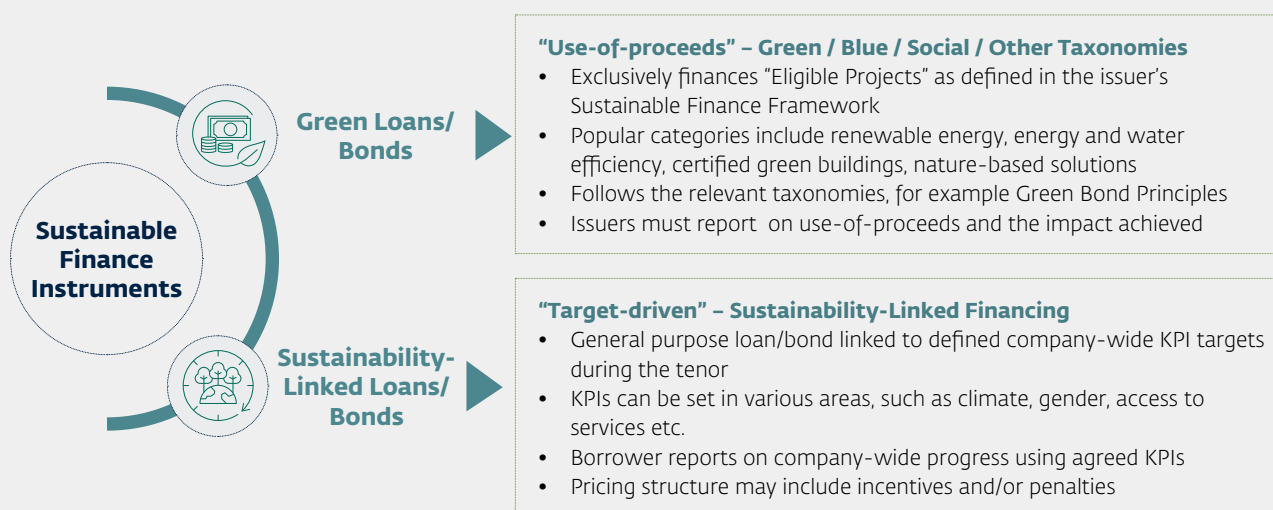
“Use-of-proceeds” finance refers to the underlying assets under investment, which must align with one or more of the taxonomies described more in detail below. While green bonds and loans apply to specific assets, “target-driven” sustainable-linked finance incentivizes borrowers to reach company-wide targets. The scheme is explicitly designed to create financial incentives for environmental, social, and governance targets on a portfolio level. Incentive structures can vary, including an increase (step-up) in the interest rate paid by the firm if the target is missed, a decrease (step-down) if the target is met, or both.³⁴ The Guide will first explain various “use-of-proceeds” taxonomies and then explain the “target-driven” approach, finally illustrating through case studies how various stakeholders tracked in this Guide have achieved successful finance program utilizing one or both of these schemes.

This reference guide looks at sustainable building finance taxonomies along the vectors of green construction, resilience, blue finance, circular economy, and nature finance and nature-based solutions.

While additional definitions may exist, set for example by NGOs, it is important to note that this document is a finance reference guide. That means that the definitions employed here will be referring to financial markets and finance. This connection is important because without the tie-in to finance and a strong business case that underpins action, sustainable change could not be implemented simply on the basis of technical measures that benefit the environment. While the world has a fair share of environmental pioneers, most private sector developers, investors, and buyers tend to be motivated by financial considerations for the bottom line. In addition, the guide also refers to internationally accepted taxonomies, ensuring that projects looking for finance can appeal not only to local but also to international investors.

FIG 8

Types of Sustainable Finance Instruments



³⁴ IFC (2022b).

Sustainability in this guide refers to energy, water, materials, circularity, and nature-based solutions.

While there are other aspects of sustainability, including gender, disability access, and economic inclusivity, this guide focuses on the definition of sustainability that more narrowly tracks climate-related standards. These standards do have some overlap: for example, green finance focuses on energy, water, and materials in the built environment, but the water-related solutions can also be applicable to blue and nature finance. The materials portion of the building may also be applicable for circular economy and nature finance. All of these strategies can feed into the building's resilience, allowing the investor, owner, or operator to disclose the comprehensive suite of climate-related measures through ESG disclosures. Each of these standards will be further elaborated in below chapters.

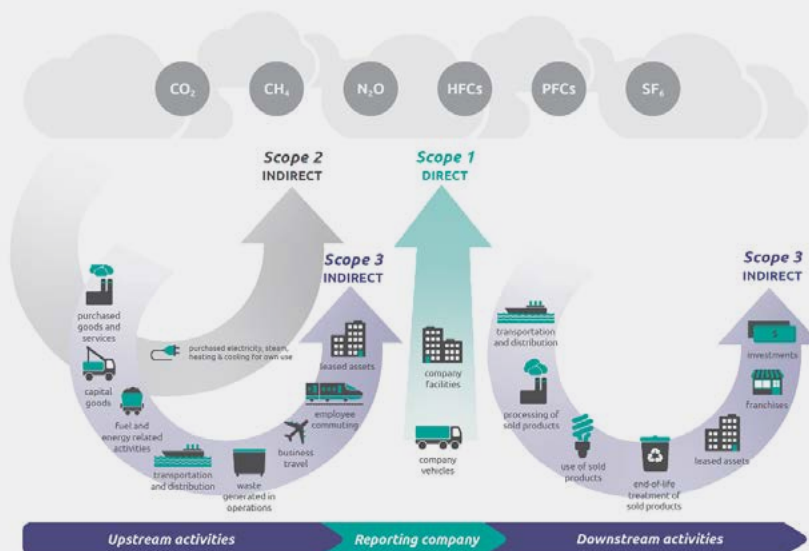
Property owners and investors are increasingly focused not just on Scope 1, but also on Scope 2 and 3

emissions. Scope 1 emissions are direct greenhouse (GHG) emissions that occur from sources that are controlled or owned by an organization (e.g., emissions associated with fuel combustion in boilers, furnaces, vehicles). Scope 2 emissions are indirect GHG emissions associated with the purchase of electricity, steam, heat, or cooling. Scope 3 emissions are part of the supply chain – either in the upstream or downstream activities. For financial institutions, Scope 3 emissions represent emissions from financed companies. On the flip side, the Scope 1 and 2 emissions for property owners represent Scope 3 emissions for their tenants, as seen in Figure 9.

Scope 3 emissions are becoming increasingly important because the value chain can account for the majority of a company's total carbon footprint, making them critical for any meaningful decarbonization efforts and especially for achieving net zero goals. Companies are increasingly facing regulatory pressures to measure and report on their

FIG 9

Scope 1, 2, and 3 emissions



SOURCE: EPA

Scope 3 emissions, driven by regulatory requirements and growing stakeholder expectations for transparency and accountability. For example, an industrial manufacturing company may want to have a low carbon footprint throughout its value chain, looking for industrial real estate with a deep commitment to sustainability. A global company may have similar interest for their office space. Understanding and managing Scope 3 emissions helps identify and mitigate risks in the supply chain, such as those related to resource availability, energy efficiency, and

environmental performance of suppliers. Addressing Scope 3 emissions can lead to opportunities for innovation, such as developing more sustainable products and processes, and can also create cost-saving opportunities through increased energy efficiency and procurement of renewable energy. While the majority of the examples in this Guide will focus on Scope 1 and 2 emissions, there will be case studies of companies who have successfully launched green leases and other initiatives focused on Scope 3 emissions.





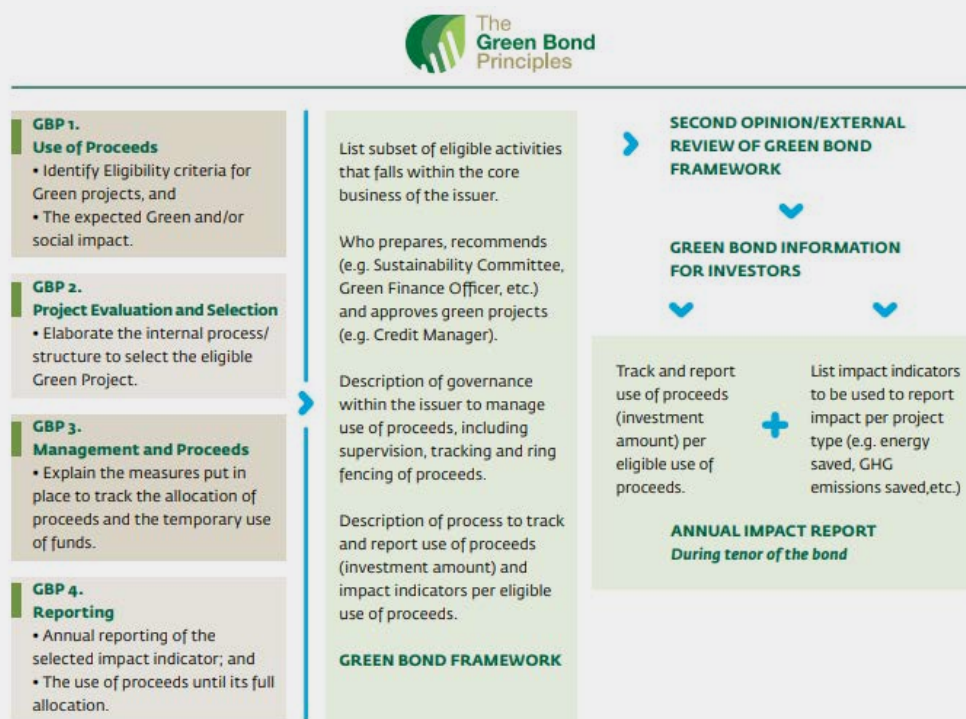
2.1 Green building taxonomies

Since green finance is the most mature area of sustainable finance, the process to access green finance has been broken down into discrete steps that investors and companies can follow. IFC's Green Bond Handbook: A Step-by-Step Guide to Issuing a Green Bond³⁵ includes four specific steps to design and execute a

green bond, which can also apply to a labeled green bond. The steps – which follow the Pillars of the Green Bond Principles – include: 1) use-of-proceeds – finding eligible assets; 2) project evaluation and selection; 3) management of proceeds; 4) reporting.

FIG 10

Steps to Issue a Green Bond or Green Loan



SOURCE: Green Bond Handbook: A Step-by-Step Guide to Issuing a Green Bond

The first step involves creating the Sustainable Finance Framework - the document that sets out the 'sustainable' characteristics of the intended financial structures (bonds or loans), the process that the issuer will follow in the evaluation and selection of eligible projects, and the reporting commitments of the issuer towards investors. The Sustainable Finance Framework should be structured around the four pillars of the Green Bond Principles (GBPs), with the objective of showing alignment and conformity. As part of the Framework, issuers are encouraged to disclose any taxonomies, green standards or certifications referenced in project selection. Sustainable buildings need not be the only area included in the Framework – commercial banks, for example, may have a portfolio of projects including buildings, renewable energy, energy efficiency, and others. However, earlier chapters have illustrated that emerging markets are lagging behind in utilizing sustainable buildings for their use-of-proceeds finance issuances. This chapter will illuminate the ease with which investors and companies

can comply with international taxonomies (step 1 – finding eligible asset). Later chapters will illustrate the business case for sustainable projects and then go through steps 2-4 of how to launch green finance.

Green building definitions have been set by international and local standards. While both investors and developers may still struggle to understand what exactly defines a green building, these definitions have in fact been well understood by international and many local standard setting bodies. International financial standards are set by bodies such as the International Capital Markets Association³⁶ and the Climate Bonds Initiative³⁷, which govern the definitions of green bonds and loans in general and by sector. The European Union's Taxonomy for Sustainable Activities³⁸, though intended as a local standard, is also quickly gaining prominence as a global benchmark. Global reporting bodies that govern disclosure include GRESB³⁹, a real estate specific disclosure platform,

FIG 11

Main Taxonomies Related to Sustainable Buildings



36 ICMA (2019).
37 Climate Bonds Initiative (2023).
38 European Commission (2021).
39 GRESB (2022).

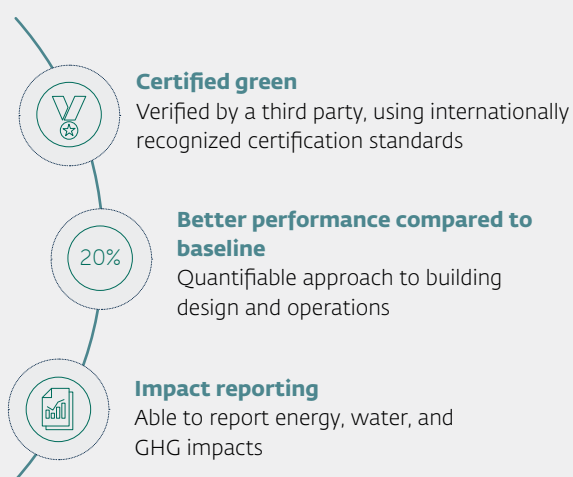
and CDP⁴⁰, a wider platform for carbon reduction reporting. In some countries, local standards also exist such as, for example, Dominican Republic Green Taxonomy.

The green building definitions converge on 3 common criteria. While the above international and local standards include a number of technical criteria, they have common elements which simplify the definition. As first communicated in our 2019 Flagship paper on green buildings⁴¹, a green building should be:

- 1) Certified as green under one of the internationally recognized certification standards or an approved national standard.
- 2) At least 20% more efficient than a baseline building without efficient design.
- 3) Able to quantitatively report impact metrics, such as energy and water savings, and greenhouse-gas emissions reductions.

FIG 12

Common Elements of Green Building Definitions



⁴⁰ CDP (2023).

⁴¹ IFC (2019).

Green certification provides many administrative benefits to investors looking for green finance.

Investors in green buildings may choose to wrestle with green taxonomies and their differences, but choosing green certification as a de-facto standard outsources the burden of verification on 3rd party providers. International certifications are almost universally accepted by all standards, so there is no need to needing to understand technical differences between various taxonomies. The burden of verification is passed on to bodies with dedicated resources for this specific work, rather than having to set

CASE STUDY 3

ProCredit Bank, Europe



ProCredit Bank is actively engaged in certifying its regional headquarters buildings across Europe, with notable success in Bulgaria where the headquarters has achieved a net-zero carbon status. In addition, ProCredit Group has achieved certification for its Head Offices in Kosovo, North Macedonia, Georgia, and Ukraine. Banks can actually channel green finance into retrofitting their existing properties or constructing new headquarters. The utilization of proceeds for such initiatives qualifies for green bonds criteria, aligning with environmentally sustainable practices. This commitment to sustainable building practices reflects the banking sector's dedication to reducing its environmental impact and contributing to a greener future.

up an in-house verification department. A certified green building, verified by a 3rd party, can easily communicate its benefit not only to the investor, but also to the developer, government, and end-user (buyer or renter). A certified building may benefit from government incentives or be shielded from penalties for inefficiency.

While green building definitions accept a threshold of 20% efficiency, investors and developers are getting even more ambitious and moving toward net zero goals. The Global Alliance for Buildings and Construction states that stopping at just 20% efficiency will very soon not be enough. For the world to meet the goals of the Paris Climate Agreement, all buildings must have net zero emissions by 2030 and all buildings must have net zero emissions by 2050, meaning that the world must also retrofit the older building stock in line with new green standards.⁴² IFC is already working with many clients around the world who have started or completed their journey toward net zero emissions. Through the “Zero Carbon Buildings for All” global partnership, we introduced the EDGE Zero Carbon certification at the 2019 UN Climate Week. A

Zero Carbon building is at least 40% more energy efficient than a typical building, and fully powered by renewable energy, which could be sourced from the building’s rooftop or off-site. Recognizing that local regulations or high costs may make it hard in many emerging countries to achieve the Zero Carbon status, the IFC introduced the EDGE Advanced certification level, recognizing buildings that are at least 40% more energy efficient on-site, with the understanding that these buildings are zero carbon ready. The levels and the requirements are described in Figure 13.

Other international or national green building certifications also advance this vision. Green Star, prevalent across Africa, supports net zero carbon by emphasizing emissions reduction and integrating renewable energy to offset building energy needs. The Indian Green Building Council (IGBC) champions energy efficiency standards that cut consumption, enabling renewable systems to push projects toward carbon neutrality. China’s Green Building Evaluation Standard (3-Star) drives net zero energy outcomes in public buildings, often using solar power to achieve near-zero reliance on external sources. LEED offers explicit net

FIG 13
Certification Levels



Certified
20% or more savings in energy, water and embodied energy in materials.



**Advanced
(Zero Carbon Ready)**
Certified, with 40% or more on-site energy savings



Zero Carbon
Advanced certification, with 100% renewables on-site or off-site, or purchased carbon offsets to top off at 100%. All energy must be accounted for, including diesel and LPG.

42 GABC (2022).

zero pathways, with LEED v4.1 credits rewarding buildings that achieve zero net energy or fully offset emissions via renewables and carbon credits. BREEAM promotes carbon-neutral strategies through low-carbon design and on-site renewable energy, aligning with ambitious emissions goals. Estidama Pearl Rating System, crafted for the UAE, enforces efficiency and solar adoption to support net zero energy ambitions in a demanding climate. The Green Building Council of South Africa (GBCSA) aids net zero carbon efforts

by focusing on emissions cuts and renewable integration tailored to local conditions. Finally, DGNB targets carbon neutrality by evaluating a building's lifecycle impact and advocating renewable energy for lasting sustainability. These certifications collectively underpin the Paris Climate Agreement's aim for emissions-free buildings by 2030 and 2050. An indicative overview of the most well known certification systems is included in Figure 14.

FIG 14

Indicative Comparison of Select International and National Green Building Standards

Certification	Countries/Regions	Key Focus Areas	Unique Features
<u>EDGE</u> (Excellence in Design for Greater Efficiencies)	Global (Developing markets emphasis)	Energy, Water, Materials Efficiency	Globally offered (and tailored for emerging markets) with quantitative approach to building physics calculation
<u>Green Star</u> (in Africa administered by the Green Building Council of South Africa)	Africa including - South Africa, Nigeria, Kenya, Ghana	Energy, Water, Emissions, Materials, Indoor Environment	Focus on environmental and social factors specific to Africa
<u>IGBC</u> (Indian Green Building Council)	India, Indonesia	Energy, Water, Waste, Materials, Innovation	Offers certification for various building types and projects
<u>China Green Building Evaluation Standard (3-Star)</u>	China	Energy Efficiency, Water Conservation, Materials, Indoor Air Quality	Government-led program; mandatory for many public buildings
<u>LEED</u> (Leadership in Energy and Environmental Design)	Global – US based	Energy Efficiency, Water Conservation, Materials, Indoor Environment	Widely recognised globally; comprehensive and holistic approach
<u>BREEAM</u> (Building Research Establishment Environmental Assessment Method)	UK, Europe, Global	Energy, Water, Health & Wellbeing, Pollution, Transport, Materials	Early pioneer in green building standards; widely adopted in Europe
<u>Estidama Pearl Rating System</u>	UAE	Energy, Water, Waste, Transport, Materials	Regionally adapted to hot desert climates, mandates for Abu Dhabi
<u>DGNB</u> (German Sustainable Building Council)	Germany, Europe, Global	Energy Efficiency, Lifecycle Impact, Social Responsibility	Focuses on the full lifecycle sustainability of a building
<u>HQE</u> (High Environmental Quality)	Primarily France, also used in other countries	Energy Efficiency, Water Management, Sustainable Materials, Indoor Environmental Quality, Environmental Impact Reduction	Originally tailored for the French market, HQE is adopted in various countries. It offers a comprehensive approach to environmental sustainability, focusing on both construction and operational phases of a building's lifecycle.

NOTE: The indicative comparison focused on widely accepted international certifications and intentionally did not try to capture every national certification, as the compendium of that kind is outside of the scope of this Guide

CASE STUDY 4

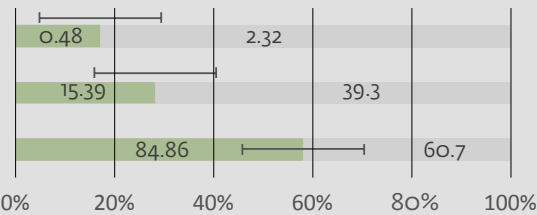
Fannie Mae – Leveraging Green Building Certifications for Multifamily Housing

Fannie Mae, less commonly known as FNMA - Federal National Mortgage Association, is a United States government-sponsored enterprise and, since 1968, a publicly traded company. The U.S. Congress founded the program to ensure liquidity in the mortgage market, in turn contributing to a more stable US economy. Fannie Mae plays a critical role in making housing more accessible and affordable in the USA and has grown to a total net worth of US\$95 billion USD.⁴³ By the end of 2024, just four years after launching its green financing, Fannie Mae’s contributions to the global green bonds market exceeded US\$132 billion, becoming the world’s largest green bond issuer as recognized by Climate Bonds Initiative. In the Multifamily category, borrowers can qualify for green financing in two ways:

- **Green Rewards: Finance property improvements** to achieve a lower interest rate, additional loan proceeds, and a free energy and water audit. Eligible improvements include efficient HVAC, low-flow fixtures, LED lighting, solar, etc. as long as the property owner commits to overall resource efficiency of at least 30% combined.
- **Healthy Housing Rewards program** provides incentives for borrowers who incorporate health-promoting design features and practices (through the Healthy Design pathway) or resident services (through the Enhanced Resident Services™ pathway) in multifamily affordable housing. Properties must meet or exceed the minimum certification standards of the Fitwel®, WELL, or Enterprise Green Communities certification systems.⁴⁴
- **Green Building Certifications:** A lower interest rate on properties with an eligible Green Building

FANNIE MAE'S DATA DYNAMICS®-
Performance Data – Green versus
Traditional Loan Performance

Methodology - The Multifamily Loan Performance Data (MFLPD) includes over 69,000 loans acquired from 2000 to December 2024, representing 89% of all acquisitions. Using a dataset of 315 standard + 152 green multifamily loans issued 2012-2024 with similar terms and ticket size.



The **Green** loans had **significantly less serious delinquencies**, supporting better credit performance (0.48% vs. 2.32% delinquent 60+ days)

The **Green** loans had lower payoff rates suggesting borrowers are holding the debt longer—an indicator for asset stability than early repayment or exit. (15.4% vs. 39.3%)

Green loans **retained 39% more of its original principal** possibly indicating stronger engagement and lower runoff. (84.6% vs. 60.7%)

Certification. More than 40 Green Building from 11 certifying bodies are recognized for both new construction and retrofits⁴⁵.

43 See the [Fannie Mae website](#) (Accessed June 2025).
44 Fannie Mae (n.d.).

45 Fannie Mae (2024).

Many countries, as well as municipal and private sector organizations, have committed to zero-carbon targets.

The Human Settlements Pathway within the UNFCCC's Marrakech Partnership for Global Climate Action, sets a vision for "a net zero world and limit global warming to 1.5°C". To achieve this, by 2030, the built environment is expected to halve its emissions. This involves ensuring that all new buildings are net-zero carbon in operation. And by 2050, all new and existing assets must achieve net-zero status across their entire life cycle, encompassing both operational and embodied emissions.⁴⁶ The UNEP's GlobalABC Global Buildings Climate Tracker (GBCT)⁴⁷ reveals limited progress in decarbonizing buildings, with CO₂ emissions rising by 5.4% since 2015, far from the required 28% reduction⁴⁸. Energy use intensity and renewable energy adoption also fall short of targets, and efficiency investments lag by over US\$1.1B.

In the private sector, UN's Race to Zero offers non-governmental entities – including companies, cities, regions, financial, educational, and healthcare institutions – to publicly commit to halving global emissions by 2030 and has grown to include over 16,000 members.⁴⁹

The voluntary Science-Based Target Initiative (SBTi) was established to both publish and validate these claims. SBTi's Net-Zero Standard, along with specific frameworks for corporates, building sector, other industries, provides both guidance and validation that a company has a science-based target and a comprehensive and achievable strategy to reach its zero-carbon commitment.⁵⁰

In terms of policies, The University of Oxford's Net Zero Stockade 2024⁵¹ reports that as of 2025, 148 countries have incorporated net zero equivalent

targets, representing at least 87% of global GHG emissions.⁵²

In Europe, the "Climate Law" in the European Green Deal⁵³ for Europe's economy and society to become climate-neutral by 2050.⁵⁴ The law also sets the intermediate target of reducing net greenhouse gas emissions by at least 55% by 2030, compared to 1990 levels.⁵⁵ China has essentially decided on a three-step strategy for "carbon neutrality. China has stated in the "14th Five-Year Plan", the first phase is to reach carbon peak by 2030, followed by reducing carbon emissions rapidly by 2045; and achieving deep decarbonization levels and carbon neutrality by 2060.⁵⁶

IFC's partners are also quickly embracing the net zero journey.

Today, almost 30% of EDGE certified projects are considered Advanced,⁵⁷ with 40% or more on-site energy efficiency. In 2024, the Philippines company Ayala Land became the largest EDGE Zero Carbon portfolio in the world, with 8 certified office buildings covering 354,000 m². Ayala Land has committed to achieving 1.5 million m² in zero carbon buildings by 2050. The buildings have an average 45% on-site efficiency compared to the local baseline, and source their power from renewable energy.⁵⁸

⁴⁶ UNFCCC (n.d.).

⁴⁷ Global Alliance for Buildings and Construction (2020).

⁴⁸ Global Alliance for Buildings and Construction (2025).

⁴⁹ Climate Champions (n.d.).

⁵⁰ Science Based Targets Initiative (n.d.).

⁵¹ Net Zero Climate (n.d.).

⁵² UNEP & GlobalABC (n.d.).

⁵³ European Commission (n.d.).

⁵⁴ Ibid.

⁵⁵ Ibid.

⁵⁶ See the [China EU Carbon Neutrality Cooperation Office website](#).

⁵⁷ As per EDGE data table on April 24, 2025.

⁵⁸ The Financial District (2024).

CASE STUDY 5

Achieving Carbon Neutrality at the Net Zero McDonald's



At the heart of the Walt Disney World Resort in Orlando, Florida, McDonald's has built the first quick-service restaurant in the U.S. designed to achieve Net Zero Energy, signaling a bold commitment to carbon neutrality. With energy use intensity far higher than most net-zero buildings due to 24/7 operations and commercial-grade kitchen loads, WSP's Building Performance team tackled the challenge by leveraging the IES Virtual Environment (IESVE). Through detailed modeling of a complex hybrid HVAC system, natural ventilation strategies, and highly specific kitchen load schedules based on real sub-metered data, WSP

enabled the project to match on-site renewable energy production with demand on an annual basis. Critical to success was the integration of passive design elements—such as solar-shading strategies and operable louvers—with electrified equipment and a photovoltaic roof system that delivers substantial energy offsets. Pursuing certification through the International Living Future Institute's Zero Energy program, this flagship project demonstrates how cutting-edge design and performance modeling can overcome the inherent challenges of high-intensity building types. From accounting for heat gains from food to optimizing natural ventilation via MacroFlo, the team used a fully integrative process to ensure every operational and architectural detail supported the building's net-zero ambition. Beyond technical achievements, this project now serves as a real-world testing ground for McDonald's global sustainability goals, supporting its science-based target to reduce GHG emissions by 36% across restaurants and offices by 2030. The Orlando McDonald's is not just a restaurant—it's a model of how net-zero design can scale, even in the most demanding environments.



2.2 Resilient building taxonomies

Climate change and natural hazards significantly threaten development and growth, causing substantial economic losses. Intense rainfall can lead to destructive mudslides and road washouts, while flooding contaminates water supplies. Elevated temperatures diminish the efficiency of electricity transmission and place additional strain on power grids due to increased cooling needs. Droughts severely impact livestock and crops, and shifts in rainfall patterns exacerbate crop pest risks, thereby jeopardizing food security. Resilience is the capability to prepare for, recover from, and progress beyond such disruptions.⁵⁹

Despite this critical need, UNEP's Adaptation Gap Report 2023 reports that developing countries need 10-18 times more adaptation finance than the current international public finance flows, with costs estimated at US\$215 billion annually this decade.⁶⁰

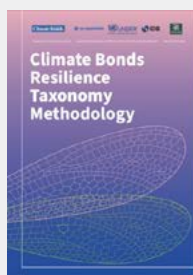
Organizations are leveraging different frameworks and standards to assess risk and drive the needed financing towards adaption efforts. The World Bank has developed a Resilience Rating System (RRS), along with an accompanying climate risk stress testing method and tool,

which provides guidance and specific criteria to assess resilience of and through a project.⁶¹ On the building level, IFC's Building Resilience Index, a free online application, provides the building sector a web-based hazard mapping and resilience assessment framework, allowing users of the tool to assess, improve, and disclose the resilience of their projects or portfolios.

There are several taxonomies for adaptation and resilience. Climate Bonds Initiative's Resilience Taxonomy (CBRT), a major expansion of the Climate Bonds Taxonomy, provides classification and eligibility criteria for climate adaptation and resilience investments. ASTM International, a global standards organization, developed ASTM E3429-24 Standard Guide, which provide real estate owners, developers, investors, insurers, lenders, design teams, and regulators with a consistent means of determining how resilient a given property is and, potentially, what would be needed to better protect it.⁶² Other organizations, such as ULI, have launched tools such as "ULI Developing Resilience Toolkit": to support real estate owners, developers, and investors with an initial, interactive search and reference tool for learning about risk reduction options.⁶³

FIG 15

Select Resilience Standards



⁵⁹ GFDRR (2021).
⁶⁰ UNEP (2023).

⁶¹ World Bank (2024).

⁶² ASTM International (2024).

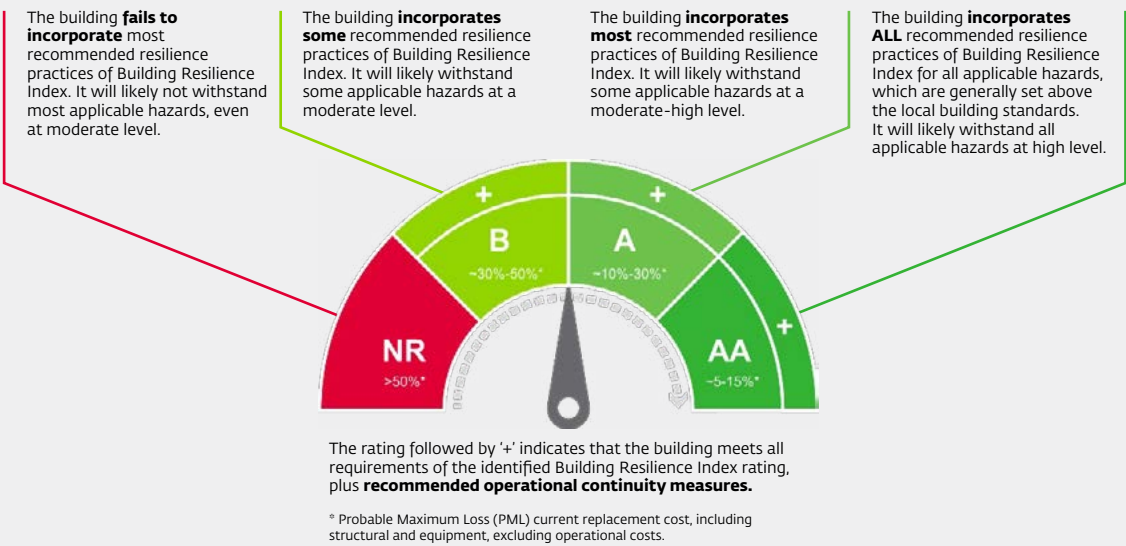
⁶³ ULI (2023).

IFC’s Building Resilience Index is quickly becoming a go-to tool that is helping to set a standard for resilience in emerging markets. BRI helps investors and developers assess their buildings in three stages: 1) Identify risk: Identify applicable natural hazards and vulnerabilities based on the location and design of a building; 2) Reduce risk: Explore risk reduction measures for enhancing the physical integrity

and operational continuity of a building; and, 3) Disclose risk: Communicate the resilience of a building by using a standardized letter grade rating system. The disclosure is verified by accredited professionals, creating a standardized framework to communicate value between investors, developers, and end-users.

FIG 16

Building Resilience Index Disclosure Framework



CASE STUDY 6

Mexico’s Vinte leading climate resilience in home construction

Vinte, Mexico’s leading developer of affordable and mid-income homes, boasting one of the most EDGE-certified portfolios worldwide, is also the leader in residential projects assessed through the Building Resilience Index (BRI). Vinte leveraged the tool across 15 development projects to screen for climate shocks in the local context and to enhance resilience measures. Vinte has issued several green and sustainability bonds to finance its programs. IFC recently supported Vinte with a US\$301

million financing package to advance green and resilient housing in Mexico, including a US\$58 million long-term loan to finance working capital and the acquisition of Javer in December 2024 and US\$243 million in debt and equity attracted to Vinte with IFC’s mobilization efforts. Vinte’s green bond, issued in June 2025, was oversubscribed 1.5 times, with the green elements allowing access to institutional investors and development finance institutions, which the developer was not able to reach earlier.



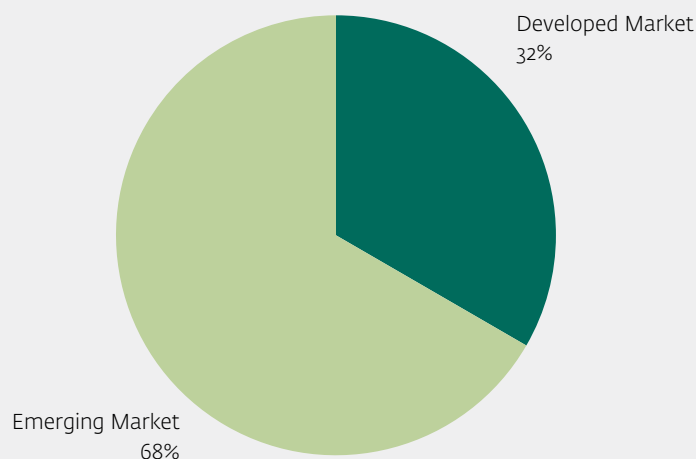
2.3 Blue finance taxonomies

Blue finance is an emerging area in climate finance which deals with water management and conservation. It offers tremendous opportunities to help safeguard our access to clean water, protect underwater environments, and invest in a sustainable water economy. As seen in Figure 17, Blue Bonds and Blue Loans are financing instruments that raise and earmark funds for investments

such as water and wastewater management, reducing ocean plastic pollution, marine ecosystem restoration, sustainable shipping, eco-friendly tourism, or offshore renewable energy.⁶⁴ This combination of green, blue, and other labeled finance can be very appealing to investors who are looking to diversify their impact portfolio.

FIG 17

Blue Bond Issuance Values



⁶⁴ IFC's Blue Finance webpage.

FIG 18
Blue Bond Use-of-proceeds

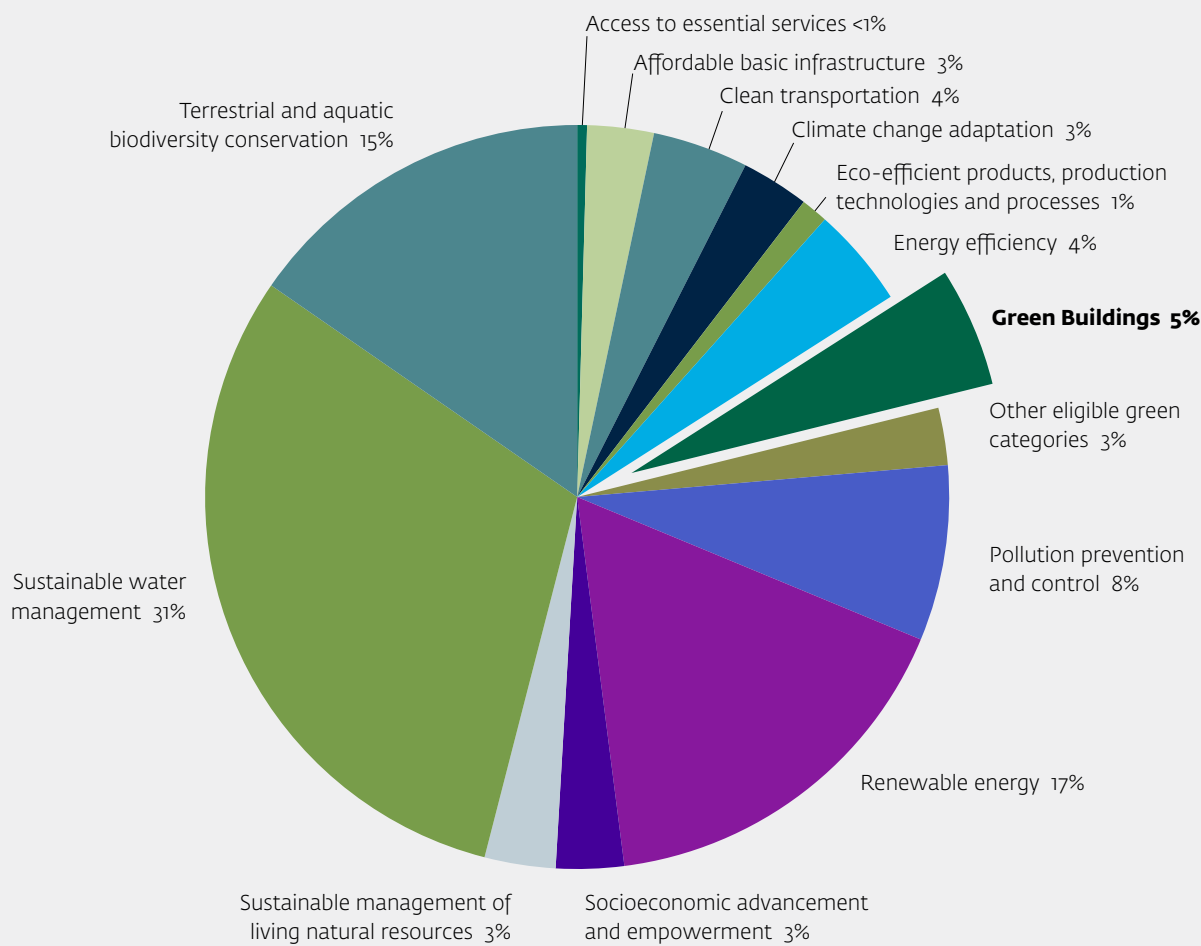


FIG 19

Blue Finance Categories

GREEN BOND PRINCIPLES AND GREEN LOAN PRINCIPLES BROAD CATEGORIES OF ELIGIBILITY					
Blue Finance Area	Pollution Prevention and Control	Natural Resource Conservation	Biodiversity ⁷	Climate Change	
				Mitigation	Adaptation
A. Water supply	***	**	**	***	**
B. Water sanitation	***	**	**	***	**
C. Ocean-friendly and water-friendly products	***			*	
D. Ocean-friendly chemicals and plastic related sectors	***			*	*
E. Sustainable shipping and port logistics sectors	***	*	**	***	*
F. Fisheries, aquaculture, and seafood value chain	***	**		*	*
G. Marine ecosystem restoration	**	***	***	*	*
H. Sustainable tourism services		**	**		
I. Offshore renewable energy production		*	**	***	
	***	Primary or direct effects	Light blue	Minor impact	
	**	Secondary or indirect effects	Medium blue	Some impact	
	*	Tertiary or derived effects	Dark blue	Strong impact	

SOURCE: Blue Finance: Guidance for financing the Blue Economy⁶⁵

Building construction and management overlaps with blue finance in the areas of water supply and water sanitation. As green building definitions involve both energy and water, this means that some of the buildings applying for green finance might also be eligible for blue finance. This may be especially important, for example, to sustainable tourism operators looking to access finance

beyond just the real estate asset, covering a more holistic set of tourism services. Building-specific strategies (such as low-flow showers and taps, efficient water closet, rain water harvesting and waste water treatment and recycling) can thus be paired with site-wide strategies (such as marine ecosystem conservation, sustainable tourism, or nature-based solutions for water management).⁶⁶

65 IFC (2022).

66 IFC (2022).



2.4 Circular economy taxonomy

The circular economy is an economic system that aligns production and consumption activities to minimize the use of natural resources and promote the regeneration of nature; maintains the value of products and materials for as long as possible; and designs out waste generation. This economic model supports the development of sustainable buildings and infrastructure. The circular economy offers economic benefits, with projections indicating a US\$4.5 trillion increase in global GDP by 2030. The circular economy can build corporate and supply chain resilience by reducing dependence on scarce resources and mitigating supply chain disruptions. Realizing this potential requires substantial financial investment, a clear understanding of the circular economy and its benefits, the establishment of an enabling regulatory environment, and the promotion of behavioral change.

The Harmonized Circular Economy Finance Guidelines have been developed to foster a common understanding of circular economy investments and to facilitate investment at scale for circular economy projects.⁶⁷ These Guidelines serve as a practical tool to identify and evaluate projects, economic activities, and business models that contribute to a circular economy across the materials life cycle, excluding water and energy. They also provide illustrative examples of project types across six sectors, including the construction and built environment, to facilitate practical understanding. Figure 20 presents circular economy activity categories, which establish a framework to assess whether the project, economic activity, or company can be classified as contributing to the circular economy. These sector-agnostic

categories are grouped according to a value chain approach to emphasize that circular economy strategies are relevant throughout the life cycle of a project, including Circular Design and Production, Circular Use, and Value Recovery.

There are numerous opportunities to integrate circular economy principles across the construction and built environment materials' life cycle. Within the Circular Design and Production category, key activities include designing for adaptability, disassembly, and deconstruction. This can be achieved through approaches such as modular design and the separation of technical and aesthetic building components, enabling easier modification, dismantling, or repurposing of buildings. For instance, designing and producing standardized modular elements, like uniform floor-to-floor heights, can significantly streamline future renovations and expansions. Additionally, incorporating multi-use spaces, such as offices that also serve as educational or exhibition venues maximizes space utilization and reduces the need for additional construction⁶⁸. Flexible interior layouts, such as movable walls like sliding dividers, further support the adaptability of multi-use spaces⁶⁹. Designing for material reuse and recycling, as well as ease of maintenance also contributes to a circular economy. The use of materials that promote regeneration and/or sustainably sourced renewable resources, like timber from regenerative sources, are eligible for circular economy finance. Other innovative uses of materials include mycelium and agricultural waste for bricks and clay and sand-based tiles. Eligible activities also include using secondary materials and industrial byproducts, such as recycled glass, recycled aluminum, and recycled or reused steel, which reduces the use of virgin resources.

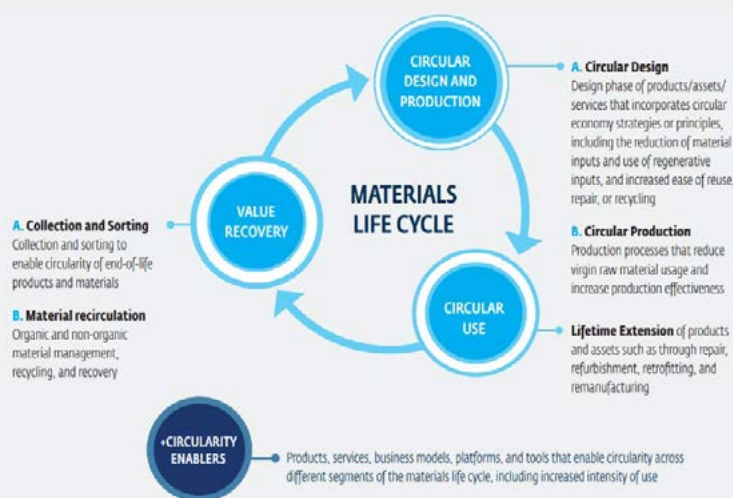
⁶⁷ IFC (2022).

⁶⁸ Arup (n.d.).

⁶⁹ Ibid.

FIG 20

Circular Economy Activity Categories



Circular Use activities in the construction and built environment sector focus on extending the life of existing assets through repair, refurbishment, reuse, retrofitting, and remanufacturing. Eligible activities include the reuse of buildings or existing spaces – such as reusing existing floor area⁷⁰ — that reduce the need for new construction. Similarly, the refurbishment of building interiors, such as offices and common areas, falls under this category, upgrading and modernizing spaces for extended use. To effectively implement Circular Use, a strong supporting infrastructure is necessary. This includes facilities dedicated to cleaning, repairing, or refurbishing building components, which prepare these products and materials for reuse. Finally, retrofitting is another circular economy activity that extends a building's lifespan, delaying its obsolescence and minimizing waste. This process involves upgrading existing buildings to improve their performance or adapt them for new uses. Retrofitting can facilitate the direct recirculation of materials through on-site reuse or their indirect recirculation through aftermarket channels,⁷¹

where recovered components are processed and made available for use in other projects. Financial institutions can design investment products for both new buildings and for retrofits, as will be detailed in Chapter 5.

Value recovery in the construction and built environment sector is a circular economy activity category focused on collection and sorting and material recirculation. Eligible activities include the development of waste management infrastructure that supports the prevention, collection, sorting, and treatment of construction and demolition waste for the purpose of reuse and recycling. This can be supported by efficient logistics networks and take-back programs to ensure the quality of materials that can be reused.⁷² This can also include implementing on-site collection and sorting during construction and demolition⁷³ to prevent waste and facilitate the reuse and recycling of materials.

70 Arup (n.d.).

71 World Economic Forum (2024).

72 World Economic Forum (2024).

73 Arup (n.d.).

Enabling products, services, business models, platforms and tools are essential for scaling circular practices in the construction and built environment sector.

A project, economic activity, or business model can receive the designation of +Circularity Enabler if it is also tied to Circular Design and Production, Circular Use, or Value Recovery. Digital platforms that promote shared use of spaces optimize space efficiency and reduce the need for new developments. Product-as-a-service and pay-per-use models—applied to systems like elevators and lighting—extend the lifecycle of building products and materials. Additionally, digital data repositories for material passports, which document the characteristics and origins of products, components, and raw materials enhance traceability of construction materials and create opportunities for reuse and recycling. Designers can use digital tools to aid planning and renovations for retrofits. For example, three-dimensional (3D) scanning technology can create digital twins of existing buildings using point clouds, allowing the integration and use of Building Information Technology (BIM) systems to enable analysis and modelling⁷⁴. Digital marketplaces that support the recycling of construction and demolition waste and the reuse of building components are also eligible for circular economy finance.

CASE STUDY 7

Circular Construction through Digitization – Madaster

Madaster is a Dutch technology company that specializes in the digitization of material flows within the construction sector. Its digital platform facilitates the tracking and reuse of materials for manufacturers, architects, engineers, contractors, demolishers, asset owners, and investors. Users of Madaster's platform can access a detachability methodology and building Life Cycle Assessments (LCAs) software. The tools help users integrate circular economy principles at the design stage by planning for disassembly and material reuse, optimizing the building's modularity and resource effectiveness. Additionally, Madaster offers tools to track materials through "material passports." These digital records can document key details about building materials, such as composition, accessibility, origin, and location within a structure, enabling easier reuse and recycling of materials.

Madaster exemplifies +Circularity Enablers that enhance Circular Design and Production by providing digital tools that facilitate design for material traceability in buildings and enable measurement of reuse, refurbishment, and recycling potential. Using "material passports" that trace details about the materials throughout the life cycle of the project enables Circular Use and lifetime extension of building components through reuse and refurbishment.

⁷⁴ World Economic Forum (2024).

⁷⁵ The detachability index of a product or element is defined according to its score on a scale from 0.00 to 1.00, based on four factors: Connection Type, Connection Accessibility, Independence, and Geometry.

CASE STUDY 8

CEMEX



CEMEX, a leading building materials company headquartered in Mexico, developed its Regenera initiative to focus on waste collection, management, recycling, and co-processing, with the aim to reduce reliance on virgin raw materials and minimize construction-related waste. In 2023, Regenera recovered over 9 million tons of construction, demolition, and excavation waste (CDEW), a 5% increase over the previous year⁷⁶. This waste was co-processed as secondary inputs for aggregates used in

concrete production, effectively reintegrating them into the construction supply chain.

Cemex aims to recover over 14 million tons annually by 2030,⁷⁷ demonstrating its commitment to circular economy practices. Regenera also incorporates byproducts from industrial processes that serve as alternatives for virgin raw materials. This approach helps CEMEX and its partners reduce waste, preserve natural resources and lower carbon emissions.

The recovery and recycling of construction materials contributes to Value Recovery by recovering valuable construction materials, diverting them from landfills and reintroducing them into the supply chain. This reduces environmental impacts and demand for virgin materials. Additionally, Circular Design and Production is demonstrated by using recycled materials in concrete manufacturing, reducing the carbon footprint of production processes.

⁷⁶ Cemex & Ellen MacArthur Foundation (2024).

⁷⁷ <https://www.businesswire.com/news/home/20240903523182/en/Cemex-expands-Regenera-circularity-business-with-acquisition-in-Berlin>.



2.5 Nature Finance and Nature-based Solutions

Nature finance is defined as financing solutions that catalyze the transition to nature-smart production practices that allow nature to regenerate, including addressing the direct drivers of biodiversity loss⁷⁸, conservation and restoration activities, and nature-based solutions in infrastructure projects. Building on the Green Bond and Green Loan Principles, IFC's *Biodiversity Finance Reference Guide*⁷⁹ details the activities that achieve these outcomes. In the context of buildings, nature finance addresses three of the direct drivers of biodiversity loss: land use change, overexploitation of natural resources, and pollution⁸⁰. Activities detailed in Sections 2.3 (Blue Finance) and 2.3 (Circular Economy) are typically considered to also be nature-smart (i.e., reduce the direct drivers of biodiversity loss) and therefore qualify as nature finance. For instance, a project that increases the use of demolition waste in construction qualifies as Circular Economy and as Nature Finance, since it reduces pollution and resource overexploitation (by reducing the burden on virgin material extraction). To avoid repetition, those activities will not be explored further in this section.

Within the built environment, integration of nature-based solutions (NBS) – approaches that integrate natural processes and ecosystems into building design and construction to address environmental, social, and economic challenges – holds potential for

cost-effectively achieving nature-smart outcomes.

To be considered nature finance, NBS must provide infrastructure-type or other services that are material to a project's operation and displace or complement man-made structure (i.e. "grey infrastructure"). See IFC's catalogues of NBS for infrastructure projects (water utilities, mining, and renewable energy)⁸¹ and cities⁸² for specific guidance and case studies illustrating the business rationale for NBS.

The business case for NBS when valued at the building level is gaining credibility. This is driven by improved energy efficiency through insulation and cooling effects, increased capacity of stormwater management, enhanced sustainability credentials, climate change mitigation (carbon sequestration) and adaptation (increased resilience) benefits, potential lower upfront investment (CapEx), and potential lower operational and maintenance costs (OpEx). Generally, NBS in and around buildings can also enhance property value and boost revenue generation from increased tenancy occupation rates and higher rent.⁸³ While NBS generally are more effective at a larger spatial scale, such as neighborhood or development level, a business case for integration of NBS in a single building can still be made. Below is a high-level, non-exhaustive list of the practical application of NBS for the built environment and a business case for their integration in individual buildings and in surrounding landscapes.

⁷⁸ Direct drivers of biodiversity loss include land use change, over exploitation of natural resources, pollution, and invasive species. Climate change is also a direct driver of biodiversity loss, but IFC only considers climate-related activities that have significant localized biodiversity benefits as nature finance as there are other, well-developed taxonomies for investments and investment activities that target climate change mitigation.

⁷⁹ IFC (2022a).

⁸⁰ Invasive species are also a direct driver of biodiversity loss but are unlikely to be substantially addressed by the buildings sector due to small footprints of projects.

⁸¹ IFC (2023a).

⁸² IFC (2024a).

⁸³ Perini and Rosasco (2013).

FIG 21

Nature-Based Solutions

Nature-Based Solutions within Building Footprint		
Nature-Based Solution	Description	Business Case
Green facades	Vertical garden system installed on a building's exterior wall, typically involving a support structure (often a grid) and plants trained to climb or grow upwards along the structure.	Green facades can reduce energy demand for air-conditioning up to 40–60%.⁸⁴
Green roofs	Roof covered with vegetation.	A green roof can generate an NPV of US\$4.52/m² and payback in 6.2 years at an IRR of 5.2% with benefits from stormwater management, energy efficiency, and reduced roofing replacement and disposal costs with a longer service life than most conventional roofing options.⁸⁵
Nature-Based Solutions in Development's Surrounding Landscape		
Nature-Based Solution	Description	Business Case
Bioswales and detention / retention ponds	A vegetated ditch or channel designed to collect, convey, filter, and infiltrate stormwater runoff.	For a typical road, a 4-meter bioswale can reduce ~25% of total rainfall runoff.⁸⁶
Permeable pavements	Alternatives to gray pavements that include a filter layer to infiltrate, treat, and store rainwater and reduce runoff through seepage to underlying layers.	- Permeable concrete sidewalks can have a life cycle cost around half that of traditional, impermeable concrete (US\$8/ft² and US\$15/ft², respectively) due to necessity of inclusion of other drainage solutions for the latter.⁸⁷ - Permeable pavements can reduce runoff volume by 40–50%.⁸⁸
Pocket parks	Small, open spaces distributed throughout the urban landscape to serve the immediate population of a neighborhood and provide a variety of small-scale recreation possibilities.	Pocket parks can reduce the urban heat island effect, leading to cooler temperatures in their immediate vicinity.⁸⁹
Rain gardens	A shallow, planted depression designed to capture and filter rainwater runoff, ultimately allowing it to soak into the ground.	- A rain garden can reduce stormwater runoff by 90% and remove 65–90% of pollutants.⁹⁰ - A rain garden can also reduce the urban heat island effect.⁹¹
Street tree canopies	Planting large native tree species to circulate rainwater, create a local microclimate, absorb pollution, provide shade, and attenuate heat.	- A 10% increase in the tree canopy cover reduces the maximum midday air temperature by about 1°C, reducing cooling costs.⁹² - An average annual per tree management cost of US\$19 and benefit of US\$47.83, resulted in a US\$2.52 returned benefit for every USD.⁹³
Terraces and slopes	Land-based structures that stabilize slopes and loose soil that are typically exposed to a variety of hazards, including floods, cyclones, droughts, landslides, and mudslides, including living smiles, wattle fences, and vegetated gabions.	Terraces can reduce runoff (41.9%) and soil loss (52%) and improve soil moisture content (12.9%).⁹⁴

Note: the benefits from NBS are climate-, terrain-, and design-specific. The business cases laid out in the above table should not be generalized to all use cases; specific feasibility and cost-benefit analysis should be performed for each individual project.

⁸⁴ Perini and Rosasco (2013).

⁸⁵ World Bank (2020).

⁸⁶ American Society of Landscape Architects.

⁸⁷ U.S. Environmental Protection Agency (2021).

⁸⁸ Aladesote (2022).

⁸⁹ Rosso et al (2022).

⁹⁰ U.S. Environmental Protection Agency (2010).

⁹¹ Kasprzyk et al (2022).

⁹² IFC (2024a).

⁹³ Ewane et al (2023).

⁹⁴ Deng et al (2021).

While NBS in buildings are not new, they are typically not standard practice in emerging markets, and further steps need to be considered when integrating NBS in buildings.

It is necessary to evaluate the benefits NBS offer both financially and holistically, bearing in mind that NBS benefits come with a set of accompanying challenges. In some cases, there can be higher upfront costs to implementation, higher operational and maintenance costs, additional engineering requirements to enable adoption (e.g. green roofs are heavier than conventional roofs), and more. In some instances, therefore, integrating NBS can be more expensive than a conventional approach. When a financier or developer takes a holistic view of a building and its surrounding landscape, however, the potential additional benefits NBS offer, such as increased occupancy rates, tenant satisfaction, and energy efficiency, typically outweigh the additional costs incurred through adoption of NBS. In addition to the immediate business case, integration of NBS in buildings and the surrounding landscape have further localized societal benefits, such as enhanced biodiversity and increased employment opportunities.

Before implementing a NBS, it is important to confirm its feasibility and benefits by assessing its functions, cost, and suitability. This includes:

- Conducting a feasibility study to assess the technical and environmental viability of the proposed NBS intervention(s) to achieve the targeted outcome(s). NBS are site-specific, and considerations of local climate conditions and native vegetation must be taken into account.
- Undertaking a cost-benefit analysis of integrating a NBS and identifying the cost-savings when compared to conventional methods, as well as describing further benefits.
- Engaging with local governments to understand local building regulations and zoning requirements. While NBS projects can often be integrated within existing regulations, the site-specific nature of NBS may necessitate amendments in zoning to ensure optimal implementation.

After implementation, tracking the performance and impacts of the NBS can strengthen future scaling and adoption of NBS across a business, community, or city.

While preliminary studies on the impacts of NBS – as captured in the table above and illustrated in the following case study – offer a foundational financial and holistic argument for the adoption of NBS in buildings and their surrounding landscapes, deepening the evidence base, particularly in emerging markets, contributes to accelerating the wider implementation of NBS.

CASE STUDY 9

Tu Berlin Adlershof, Institution of Physics (Berlin, Germany)

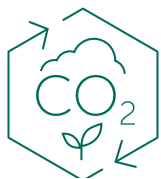


The Tu Berlin Adlershof, Institution of Physics, financed construction of new offices integrating green facades and rainwater harvesting to cool the building.⁹⁵ Constructed in 2003, the building design integrated research studies to identify recommendations for optimal water and energy use. Public financing was made available for the monitoring of performance for 6 years post-implementation.⁹⁶

Separate parts of the office building integrated standard technical sun shading (blinds) and green facades to allow for measurement of impact in a controlled setting. The 6-year analysis included comparing the indoor and outdoor temperatures from 6am to 6pm in each south-facing environment, followed by a calculation of the energy required, and the subsequent calculation of costs, to heat or cool indoors to reach 26°C. Green facades resulted in an average indoor temperature of 27°C, and standard technical sun shading resulted in an average indoor temperature of 34.5°C. The green facade resulted in operational costs of temperature regulation of 1.300 €/a, representing a 12x savings over the standard technical sun shading costs of 16.525 €/a.⁹⁷ The NBS resulted in lower costs for a better performance, while also benefiting the local environment.⁹⁸

⁹⁵ Nature Networks.
⁹⁶ Enzi (2025).

⁹⁷ Enzi (2025).
⁹⁸ For further information on the practical application of green facades, please reference: Berlin Senate for Urban Development (2010).



2.6 Carbon Markets

Carbon markets for sustainable buildings are a growing area of sustainable finance, allowing project developers and financiers to further monetize their sustainability commitment. Carbon credits are a key market-based mechanism designed to mitigate climate change by incentivizing the reduction or removal of greenhouse gas (GHG) emissions. They represent a unit of measurement for one metric ton of carbon dioxide equivalent (CO₂e) emissions that has either been avoided or removed from the atmosphere. Building owners can sell carbon credits generated by their green practices, providing an additional income source beyond energy and water savings. The potential for carbon credit revenue can make green buildings more economically attractive, offsetting higher upfront costs associated with sustainable construction. This will encourage building owners to adopt energy-efficient technologies, renewable energy sources, and sustainable building materials.

Carbon markets guidelines for sustainable buildings are still being developed. Developers and financiers may be able to more readily utilize solar rooftop as one of the areas of sustainable construction. Other methodologies which look at the building asset more holistically are still being considered, through both regulated and voluntary markets. For example, Verra – the organization that manages the Verified Carbon Standard, the world’s largest voluntary carbon market standard – has one methodology designed for education campuses, quantifying GHG emission reductions through energy efficiency measures and renewable energy deployment.⁹⁹ The Gold Standard, another agency providing accepted frameworks, has methodologies for sustainable concrete and biomass heating of buildings. The World Bank Group is actively working with partners such as GIZ, PEEB (Partnership for Energy Efficiency in Buildings), and others to help develop guidelines for both regulated and voluntary markets.

⁹⁹ See [Verra website](#).



2.7 Sustainable-Linked Finance

Sustainability-linked financing (SLF) incentivizes companies to pursue ambitious, long-term environmental and social goals. SLF achieves its sustainability impact by tying pricing to the achievement of measurable goals, usually through interest rate step-ups or step-downs. Rather than focusing on individual assets, SLF focuses on a company-wide, portfolio performance. To impact-focused investors, achievement of robust key performance indicators (KPIs) – which can be in environmental, social, or governance categories – are just as important as financial returns. This is why green, blue, or resilient bonds are known as “use-of-proceeds” finance while SLF is seen as “target-driven” finance.

To launch sustainability-linked finance, both sustainability-linked loans (SLLs) and sustainability-linked bonds (SLBs) require a framework outlining clear sustainability targets, performance indicators (KPIs), and reporting mechanisms. The process for SLF is very similar to the process for green bonds. Instead of focusing on individual assets, however, the issuer (whether investor or real estate owner) commits to company-wide performance targets. Contrary to other sustainable finance instruments (i.e., green, social, and sustainable), sustainability-linked loans and bonds generally have no constraints on the use-of-proceeds. In many cases, these products are used for general corporate purposes, where the borrower retains full discretion as to the allocation of capital. This is part of the reason that these instruments have grown so fast. However, it is important for companies to have credible action plans to achieve their sustainability targets, including an associated financial plan. Issuers should engage with investors to ensure the relevance and ambition of the selected KPIs. Credible reporting and verification are crucial for building trust and attracting sustainable investors.

Key steps in launching sustainable-linked finance include:

- 1. Develop and Verify a Framework:** Establish clear and measurable sustainability performance targets that align with the issuer's overall ESG strategy. Choose KPIs that are relevant, material, and verifiable to track progress towards the sustainability targets. Create a detailed Framework outlining the KPIs, targets, reporting mechanisms, and verification processes. Consider obtaining external reviews or verification to enhance the credibility of the Sustainability Framework.
- 2. Set Loan Characteristics:** Engage with investors to gain support and ensure the framework is aligned with their expectations and investment criteria. Define how the financial terms of the loan (e.g., interest rate, margin, or principal) will be affected by the achievement of the sustainability targets.
- 3. Report and Verify:** Maintain transparent and regular reporting on progress towards sustainability targets and the use-of-proceeds. Implement robust verification processes to ensure the accuracy and reliability of the reporting on sustainability performance.

These steps have been outlined in key documents such as Sustainability-Linked Bond Principles¹⁰⁰ and Sustainability-Linked Loan Principles¹⁰¹.

¹⁰⁰ International Capital Markets Association (2023).

¹⁰¹ Loan Market Association (2025).

IFC is well positioned to support the scale-up of sustainability-linked financing in emerging markets.

IFC's offer to companies combines IFC's globally recognized expertise in sustainability and impact measurement, its deep understanding of local markets, its access to blended finance and financing in local currencies, and its funding for pre-investment work. IFC can successfully play the role of sustainability coordinator, leveraging internal know-how on impact measurement and sustainability. IFC assigns a sustainability coordinator to each transaction, composed of inhouse experts from its climate business department and

its advisory team, with activities including: (i) identifying corporate metrics and benchmarking proposed targets; (ii) defining relevant reporting methodologies and external verification mechanisms for target compliance; (iii) structuring financial incentives that are commensurate with the target's ambition, drafting sustainability-linked financing frameworks whenever needed, and incorporating legal language in the documentation; and (iv) assisting in the second opinion of the sustainability-linked financing framework, if required.



2.8 Taxonomies Illustrated through Case Studies

NEPI Rockcastle illustrates how a company can evolve its sustainability strategy from “use-of-proceeds” to company-wide targets eligible for sustainability-linked finance. The company launched its Green Finance Framework in 2020 and updated it in 2023, with second party opinions provided by Sustainalytics and ISS, respectively. The Use-of-proceeds

framework is a fairly simple two pages focusing on 1) construction of new buildings, 2) acquisition and ownership of buildings, and 3) refurbishment of existing buildings. In each of these three categories, NEPI Rockcastle focused on green buildings with the compliance to EU Taxonomy or one of the internationally recognized green buildings certifications, including BREEAM, LEED, EDGE, or HQE.¹⁰²

FIG 22

NEPI Rockcastle Use-of-proceeds Green Framework

Eligible Category	Eligibility criteria ¹	EU Environmental Objectives & UN SDGs
Green buildings	1. Construction of new buildings that: - Comply with the EU Taxonomy Substantial Contribution Criteria to Climate Change Mitigation (7.2). - The Primary Energy Demand (PED)² is at least 10% lower than the PED resulting from local Nearly Zero-Energy Building (NZEB) requirements. The energy performance must be certified using an as-built Energy Performance Certificate (EPC). - For buildings larger than 5,000m² upon completion, the building resulting from the construction undergoes testing for airtightness and thermal integrity, 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. - For buildings larger than 5,000m², the life-cycle Global Warming Potential (GWP) 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. Or - Meet or expect to meet recognised standards³ for best practices in energy and resource efficiency and low-GHG emissions: - BREEAM (Excellent and above); - LEED (Gold and above); - EDGE Certified; - HQE (Excellent or above).	Climate Change Mitigation
	2. Acquisition and ownership of buildings that: - Comply with the EU Taxonomy Substantial Contribution Criteria to Climate Change Mitigation (7.2). - For buildings built before 31 December 2020, the building has at least an Energy Performance Certificate (EPC) class A or alternatively is within the top 15% of the national or regional building stock expressed as operational Primary Energy Demand (PED)⁴. - For buildings built after 31 December 2020, the building meets the criteria specified in Activity 7.2 of EU Taxonomy that are relevant at the time of the acquisition (including PED criterion and additional criteria specified for buildings larger than 5,000m²). - For large non-residential buildings (with an effective rated output for heating systems, systems for combined space heating and ventilation, air-conditioning systems or systems for combined air-conditioning and ventilation of over 290 kW); they must be efficiently operated through energy performance monitoring and assessment. Or - Meet or expect to meet recognised standards³ for best practices in energy and resource efficiency and low-GHG emissions: - BREEAM (Excellent and above); - LEED (Gold and above); - EDGE Certified; - HQE (Excellent or above).	
Green buildings	3. Refurbished existing buildings - Comply with the EU Taxonomy Substantial Contribution Criteria to Climate Change Mitigation (7.2). - The building renovation complies with the applicable requirements for major renovations⁵. - Alternatively, it leads to a reduction of primary energy demand (PED) of at least 30%⁶. - Or: Deliver two letter grade improvements according to local Energy Performance Certificate, against the baseline performance of the building before the renovation. - Or: Meet or expect to meet recognised standards³ for best practices in energy and resource efficiency and low-GHG emissions: - BREEAM (Excellent and above); - LEED (Gold and above); - EDGE Certified; - HQE (Excellent or above).	Climate Change Mitigation
	Eligible Green Projects can be owned by any of NEPI Rockcastle's subsidiaries or by joint venture companies. For joint ventures, NEPI Rockcastle will only include assets or capital expenditures equal to, or lower than, the total funding provided by the Group.	

In 2023, the company launched a Sustainability-Linked Financing Framework which set out company-wide targets (and also served as a catalyst for the refreshed “use-of-proceeds” framework). Based on its strategy to “invest in healthy and sustainable buildings”, NEPI Rockcastle selected two KPIs: 1) reduction of the intensity of greenhouse gas emissions (Scope 1 and 2) from operations, and 2) common areas energy intensity reduction.¹⁰³ The company provided historic data and an efficiency step-down from the latest baseline. In its Annual Report, in the section focused on sustainability, the company goes further, disclosing information across vectors of energy, water, circular economy, biodiversity, and governance.

FIG 23
NEPI Rockcastle Sustainability-Linked Financing Framework

Year	Scope 1&2 greenhouse gas emissions intensity (kg CO2/m²)
2019	46.335
2020*	31.598
2021*	23.372
2022**	18.726

*Covid-19 Pandemic restrictions
**Three assets acquired in the end of 2022 (Ploiesti Shopping City, Forum Gdańsk and Copernicus) which were not included in the 2022 annual report figures are added to the 2022 baseline in this document. Historical data has been collected in the meantime and the figures were updated.

Year	Intensity of energy in the common areas (kWh/m²)
2019	128.1
2020*	99.9
2021*	111
2022**	100.6

*Covid-19 Pandemic restrictions
**Three assets acquired in the end of 2022 (Ploiesti Shopping City, Forum Gdańsk and Copernicus) which were not included in the 2022 annual report figures are added to the 2022 baseline in this document. Historical data has been collected in the meantime and the figures were updated.

SPT1 (based on KPI 1) - Scope 1&2 GHG emissions. Decrease Scope 1&2 GHG emissions intensity by 40% over 2024-2030 period, compared to the 2022 baseline.

GHG Intensity Of the baseline	2022 (baseline)	2024	2025	2026	2027	2028	2029	2030
	100%	95%	90%	85%	80%	75%	70%	60%

SPT2 (based on KPI 2) - energy intensity for common areas. Decrease energy intensity in common areas by 30% over 2024-2030 period, compared to the 2022 baseline.

Energy Intensity Of the baseline	2022 (baseline)	2024	2025	2026	2027	2028	2029	2030
	100%	95%	93%	90%	85%	80%	75%	70%

Asia Green Real Estate is committed to certifying its investments on property, portfolio, and fund level with the appropriate sustainability accreditations. The company's Sustainability Report includes both the Framework for operations and for impacts.¹⁰⁴ Because it works across both Asia and Europe, Asia Green ensures compliance with European regulations aiming to increase transparency for sustainable investment products. GRESB – a major real estate disclosure platform – serves as a crucial tool for investors to understand and measure the performance of funds and assets against the most important environmental, social, and governance metrics and make informed decisions. The company's participation in GRESB assessment helps them to measure sustainability efforts and to stand out as a leader in Asia.

In 2025, Asia Green has become the first GRESB partner in Indonesia and will actively support the expansion of GRESB initiatives in Indonesia, fostering greater ESG adoption in the region and providing a range of services to support companies within the real estate industry in completing their GRESB Assessments.

Notice that Asia Green relies on local and internationally recognized green building certifications as part of its green building finance compliance. However, the journey starts with their proprietary EcoTool which enables them to benchmark the building's performance and identify potential areas for improvement. Asia Green believes green certified assets are the new standard for occupiers in Asia, providing a significant competitive advantage in aligning with global sustainability benchmarks.

Aavas finances self-built housing in India, where the need for green homes is high but availability of green financial products is low. Aavas collaborated with IFC with the hopes of being able to access international green finance, but understanding that the certification standards are too complicated for a compliance by self-built homes, as they

103 NEPI Rockcastle (2023b).

104 Asia Green Real Estate (2023).

FIG 24

Asia Green Real Estate Sustainability Framework

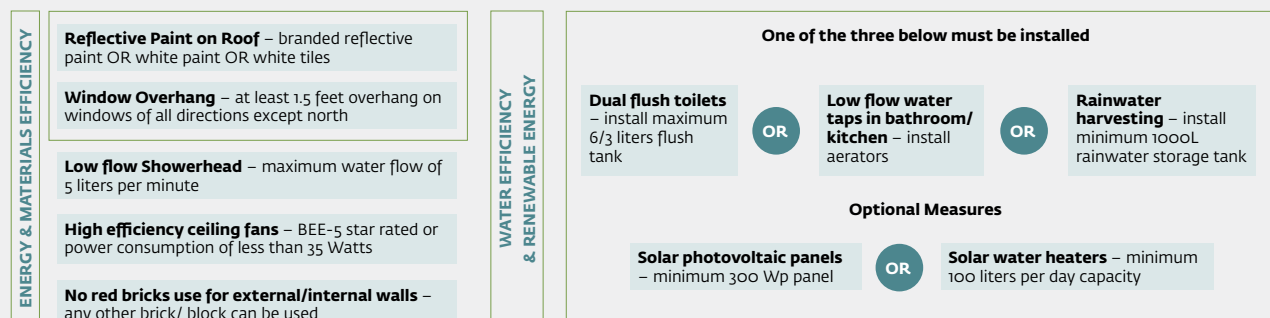
Fund level	SFDR	Accreditation in compliance with Sustainable Finance Disclosure Regulation
Portfolio level		ESG reporting framework, specializing in real estate and infrastructure investments across the world
Property level	  	Asia Green Real Estate's proprietary green building tool Certification program by IFC, a member of the World Bank Group, focused on making buildings more resource-efficient Green building standards applicable to individual investments

have been designed for formal developments. IFC and Aavas worked together on a process that simplified technical requirements while preserving the integrity of the green certification. IFC used EDGE to model self-built homes and created a prescriptive checklist that still ensured minimum 20% reduction in energy, water, and materials. Homeowners who comply with this vastly simplified but still robust

prescriptive list can have access to concessional finance to offset the additional cost of green construction. The simplified certification checklist and process enabled Aavas to access international green finance and has created a green self-built wave in India. IFC has now financed US\$340 million across five housing finance companies in India for affordable and green affordable housing.

FIG 25

Self-Built Home Green Eligibility



Absa has a number of reports and disclosures related to climate, as a large, diversified, multinational bank in Africa, including the Absa Group Sustainability and Climate Report¹⁰⁵ and the Sustainable Finance Issuance Framework.¹⁰⁶ Again, in line with their more diversified portfolio, Absa’s framework also includes renewable energy, energy efficiency, pollution prevention and control,

sustainable water and waste water management, clean transportation, climate change adaptation, environmentally sustainable management of living natural resources and land use. Their green building definition follows national, regional, and internationally recognized certifications. Absa also discloses their process for project evaluation and selection, management of proceeds, and reporting.

FIG 26

Absa Group’s Green Building Finance Eligibility and Reporting

Green buildings	 	Green buildings that meet regional, national or internationally recognised standards or certifications.	- Certified green commercial or residential buildings: - Minimum Green Star 4 category, Energy Water Performance (EWP) Level 6, Leadership in Energy and Environment Design “Gold” Certification or International Finance Corporation’s Excellence in Design for Greater Efficiencies (EDGE) certification - Replacement of existing heating/cooling systems in buildings with more efficient, non-fossil fuel powered systems, or installation of new cogeneration/trigeneration/combined heat and power plants that generate electricity in addition to providing heating/cooling - Waste heat recovery improvements.
Green buildings		- Number of green buildings funded by eligible certification (e.g., EDGE, Green Building Council South Africa Green Star, etc.) - Total m² of green buildings funded - Total m² of energy-efficient properties funded - Estimated annual CO₂ equivalent emissions reduction/avoidance (tonnes CO₂eq/year) - Number of mortgages provided to green-certified houses/residential projects - Number of people who benefitted.	

SOURCE: Absa Sustainable Finance Issuance Framework

¹⁰⁵ Absa (2024).
¹⁰⁶ Absa (2023).

FIBRA Macquarie released their Sustainability Linked Financing Framework in 2023.¹⁰⁷ While they are aligned with Mexico's Sustainability Taxonomy on the use of green proceeds, FIBRA Macquarie launched its SLF Framework as they see sustainability across their portfolio as one of the key elements of their overall business strategy. The REIT chose the certification of their portfolio as the KPI best aligned with their commitment to improve energy efficiency through the increase of green certified assets. The KPI represents the share of Industrial portfolio GLA certified by reputed green building certifications, including: i) minimum LEED® Gold; ii) EDGE certified or EDGE Advanced where feasible; or iii) BOMA Best Gold (Building Owners and Managers Association (BOMA) of Canada. The Framework has been reviewed with a Second Party Opinion confirming alignment to the SLBPs (Sustainability-Linked Bond Principles) and the SLLPs (Sustainability-Linked Loan Principles). This framework was incorporated into a US\$150 million credit facility, which included a credit spread saving of 15bps upon completion of KPI targets. To the extent the certification target is not achieved, there is an addition to the credit spread of 15bps.

The **Colombian Government** launched the first Green Taxonomy in Latin America and the Caribbean in 2022.¹⁰⁸ Aligning with international standards and in line with the Paris Agreement's 1.5°C trajectory, it responds to the Nationally Determined Contributions (NDCs) acquired on the Paris Agreement and has a high level of interoperability with the EU Taxonomy. The Government also introduced two usability guidelines, targeted at both general and banking sector users. These guidelines serve as official tools, simplifying the application of the Green Taxonomy and encouraging the use of taxonomy for labelling green bonds, investment portfolios, and voluntary pension funds. For green buildings, the Taxonomy specifies certain technical achievements that go beyond the relevant building codes and also accepts equivalence with international certifications (such as LEED and EDGE) and national programs (such as CASA Colombia). In addition, CAMACOL has launched "Circular Route," a platform created to build awareness and evaluate advances in circular economy with the construction value chain. More Information is available from rutacircular.camacol.co.

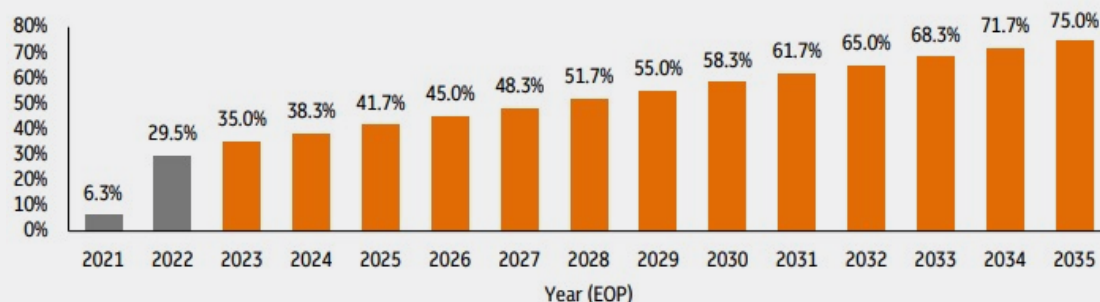
FIG 27

FIBRA Macquarie SLF key performance indicators

FIBRA Macquarie has set the following annual SPTs for its KPI:

A long-term target to increase the percentage of certified industrial gross leasable area (GLA) over total industrial portfolio to 75% by 2035 from a 2021 baseline. Annual SPT trajectory to meet long term target below:

Percentage of certified Industrial gross leasable area (GLA) over total Industrial portfolio GLA



¹⁰⁷ FIBRA Macquarie (2023).

¹⁰⁸ Government of Colombia (2022).



2.9 Chapter 2 Key Messages

- Sustainable finance includes both “use-of-proceeds” (asset based taxonomy) and “target-driven” (portfolio key performance indicators) financial mechanisms.
- Use-of-proceeds mechanisms for sustainable buildings could include taxonomies related to green construction, resilience, blue finance, circular economy, and nature-based finance. Of these, green building taxonomies are the most mature and most well understood, with many case studies of issuers who have used the green taxonomy to access international green finance.
- Green building definitions can be fairly simplified as international and national taxonomies usually accept equivalency with international or national green certification standard. Certification not only ensures compliance with financial mechanisms but communicates value between investors, developers, and end users.
- Other areas of sustainability – resilience, blue finance, circular economy, and nature-based finance – are new and rapidly evolving areas. Alignment with these taxonomies can attract additional investors committed to these KPIs. There is generally an overlap between the different areas of sustainability, with many tools and guides that can help projects reach the eligibility criteria.
- Investors and real estate companies have started to launch sustainability-linked finance frameworks, where they commit to company-wide targets. Investors are passing on incentives for these targets, usually in the form of lowered interest rates.

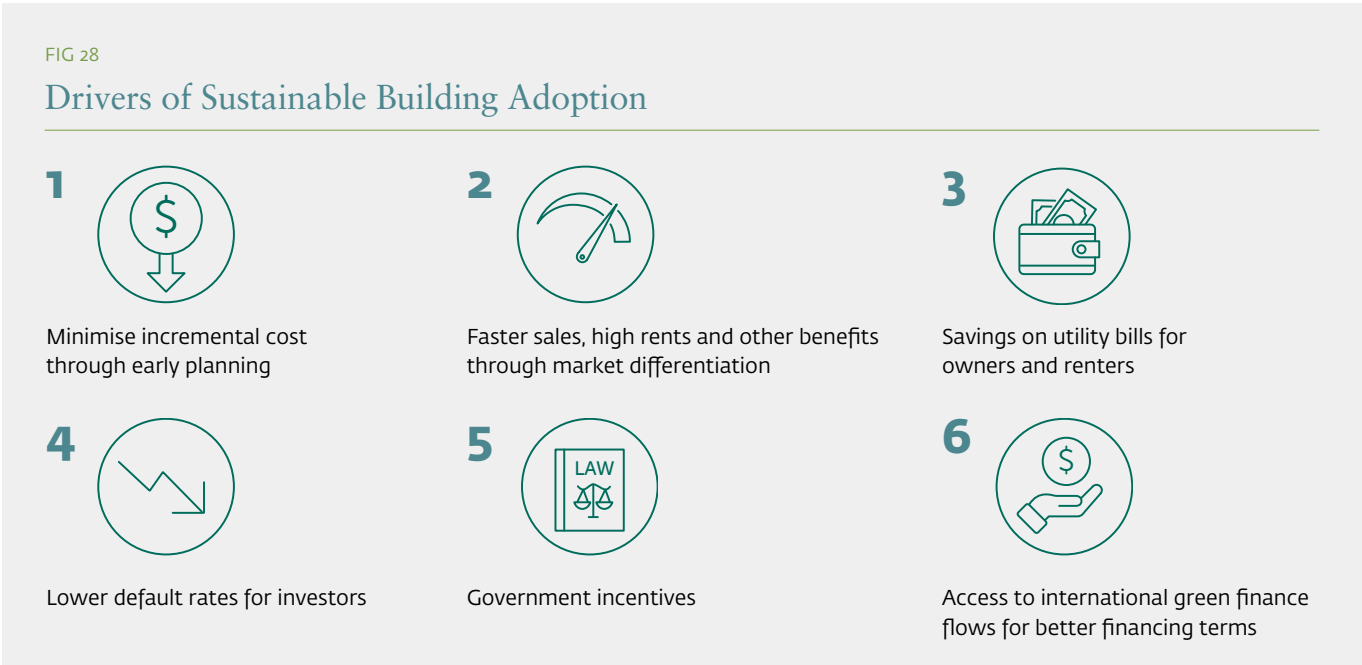
3

Financial Value of Sustainable Buildings: Why the Investors *Will* Care

There are 6 main drivers for sustainable building adoption.

Despite the seemingly low uptake of sustainable buildings finance globally, success stories from countries like Colombia show that there are indeed drivers of profitability for sustainable buildings. As seen in Figure 28, these are:

1. Minimized incremental cost through early planning;
2. Faster sales, higher rents, and other benefits through market differentiation;
3. Savings on utility bills for owners and renters;
4. Lowered default rates for investors;
5. Fiscal or non-fiscal government incentives; and
6. Access to international green finance flows for better financing terms.



To the investors, the added value of sustainable buildings offers a possibility for financial innovation and new products.

In green construction, banks and funds such as HSBC, Asia Green Real Estate, and ProCredit Bank are innovating by creating awareness of affordability, building technical capacity for developers, recognizing lower credit risk and thus offering discounted financing rates. In green mortgages, investors such as Bancolombia, Absa, and International Housing Solutions are utilizing mechanism such as increasing allowable loan ratio, including lowered utility savings in rating the homebuyer, and attracting new homebuyers with lowered interest rate while simultaneously building a better portfolio due to lowered risk of late payments and loan defaults (more information below).

Finally, as seen in Figure 29, investors and corporates such as Acorn, Arthaland, or WDP are accessing capital markets by issuing green bonds for new portfolio of buildings, refinancing their construction loans on existing portfolios, attracting new investors or expanding into new markets, with the possibility of securitization of green portfolio in the future. These different products also allow a possibility of cross-selling. As we saw in Box 10, Nedbank’s construction and mortgages departments collaborate to engage the developer clients in order to sell mortgages, in effect financing the same property twice while keeping the risk profile low by having a deep understanding of the developers and their clients.

FIG 29

Sustainable buildings offer a possibility for financial innovation and new products



Developer finance

- Create awareness of affordability
- Build technical capacity for developers
- Recognize lower risk
- Offer discounted financing rate



Green mortgages

- Increase loan ratio
- Include utility savings in homebuyers' income
- Attract homebuyers with less risk of defaults



Green products

- Solar panels
- Batteries
- Leasing
- Fan, AC, fridge replacement



Capital markets

- Issue green bonds for new portfolio
- Securitize portfolio as collateral
- REITs
- Attract new investors

Both financial institutions and real sector companies are embracing labeled thematic bonds and loans to finance sustainable buildings. As seen in Chapter 2, the most common example of labeled thematic bonds have been green bonds. Issuers of green bonds cite access to new tranches of investors, including institutional investors, as one of the most attractive reasons to issue green bonds. Bancolombia's green bond was oversubscribed 2.7 times, with access to 72 new investors.¹⁰⁹ Vinte's green bond, issued by a corporate, was oversubscribed 1.5 times, allowing access to institutional investors and development finance institutions, which the developer was not able to reach earlier.¹¹⁰ HC Capital Properties issued the first green bond in West Africa in order to refinance the construction debt of the first EDGE green certified property in the region – Cosmos Yopougon shopping center in Cote d' Ivoire. The

strong investor interest led to the lowering of the corporate interest rate by 1.5%.¹¹¹ Green buildings have provided a clear avenue for these organizations to issue green bonds; so much so that the first green bonds in many countries (such as Colombia, Kenya, and Cote d' Ivoire) were actually earmarked for green buildings.

Data shows that green borrowers have lower default rates, leading to better portfolios for financial institutions. According to studies on home energy efficiency and mortgage risks, default risk in the residential sector is on average 32% lower for energy-efficient homes.¹¹² Another report found that the degree of efficiency matters: more efficient homes are at lower risk of default.¹¹³ A key factor is the utility bill savings which residents are able to put toward repayment of their mortgage obligations.

¹⁰⁹ Menes (2019).

¹¹⁰ Interview with the client.

¹¹¹ Interview with the client.

¹¹² University of North Carolina (2013).

¹¹³ Energy Efficiency Data Protocol and Portal (2020).

International Housing Solutions, for example, found that their rental residents save on utility bills over the course of the year the equivalent of one monthly payment in rent.¹¹⁴ In the commercial space, green buildings can have an average of 10 to 17% lower operating costs and asset values that can be more than 9% higher than comparable conventional buildings.¹¹⁵ We will see in the NEO case study in chapter four that their offices in the Philippines are able to attract higher-paying rental clients while also keeping occupancy rates low.

There is a strong correlation between sustainability and private equity real estate returns. “Sustainability and Private Equity Real Estate Returns,” a recently published academic study leverages GRESB data to explore the relationship between private equity real estate fund performance and voluntary sustainability disclosures.¹¹⁶ GRESB is the global ESG benchmark for financial markets, with an annual global aggregated benchmark data showing the state of ESG in the real industry. Results from the study indicate that GRESB reporting is associated with a 0.35% increase in total quarterly returns for the funds analyzed. This represents a notable increase, as the mean quarterly total return for the type analyzed is 1.94%. With respect to these funds’ GRESB performance, the models demonstrate that every one-point increase in GRESB ESG scoring is associated with a 0.09% quarterly or 0.36% increase in annualized total returns. In a study focused on Europe, funds participating in the GRESB Assessment outperformed non-participating funds, even when controlling for differences in fund size, investment style, and leverage. Over the 11 years of the study, funds rated for ESG performance by GRESB delivered a buy-and-hold return of 40% higher than non-participants, equivalent to around 1.8% a year.¹¹⁷ In another study focused on Asia Pacific, a significant positive relationship was found between high management and governance scores and fund returns.¹¹⁸ Funds that allocate

resources and implement effective policies to achieve strong ESG scores demonstrate robust organizational control, which serves as a reliable indicator of fund success and sustained performance. Funds that joined GRESB early on appear to generate higher returns, indicating that continued sustainability improvements can drive financial success.

There are specific benefits for investors in the residential sector. While the commercial sector makes it easier to calculate the return on investment, as building owners can more readily recoup investments at the time of construction, the residential sector is much more complex. There is an asymmetry of information between investors, developers, and end buyers. Developers are reluctant to tack on additional costs of building green because they do not believe buyers will pay the extra costs. Because of this asymmetry of information, there is a body of writing on the specific benefits of sustainable residential construction and the value that can be captured in a win-win situation by investors, developers, and end buyers.¹¹⁹ Because of the lower utility bills, a green home sold even at premium prices still provides net benefits to the end buyers. However, most developers seem to choose to recover their investments through differentiation and faster sales, rather than passing on the extra cost to the buyer – this creates an even stronger incentive for the buyer to opt for green. Finally, many banks are providing incentives – whether through blended concessional finance in a partnership with a development finance institution, or out of their own balance sheet – recovering their investment through lowered risks and lowered default rates. These options for green financial innovation are seen in Figure 30 and further described in Musić (2021). In this table, the case study was for a low-income household where utility bills (and thus savings) are very low. The benefits increase for middle and higher-income households that typically utilize more energy and water.

¹¹⁴ Cairncross and Naicker (2020).

¹¹⁵ IFC (2023).

¹¹⁶ Devine, Sanderford, and Wang (2022).

¹¹⁷ INREV and GRESB (2023).

¹¹⁸ ANREV and GRESB (2024).

¹¹⁹ See Musić (2023), Musić (2021), and Cairncross and Naicker (2020).

FIG 30

Options for green mortgage financial innovation for a low-income household

Table 5 Relative benefits of a conventional home and mortgage versus green home and innovative mortgage scenarios

	Base case: Conventional home, conventional mortgage	Scenario 1: Green home, conventional mortgage	Scenario 2: Green home, developer absorbs incremental CapEx	Scenario 3: Green home, lower mortgage down payment	Scenario 4: Green home, lower mortgage interest rate
Price of conventional home	15,000	15,000	15,000	15,000	15,000
Incremental cost of green measures	—	150	150	150	150
Price of green home	15,000	15,150	15,000	15,150	15,150
Down payment (% of price)	20%	20%	20%	15%	20%
Down payment (\$)	3,000	3,030	3,000	2,273	3,030
Loan amount	12,000	12,120	12,000	12,878	12,120
Interest rate	18%	18%	18%	18%	17.5%
Term (years)	10	10	10	10	10
Monthly mortgage	216	218	216	232	214
Monthly utility savings	—	–15	–15	–15	–15
Monthly cost of ownership	216	203	201	216	199
Change in resident's monthly cost of ownership	—	–6%	–7%	0%	–8%
Change in bank's monthly income	—	1%	0%	7%	–0.8%
Applicable case study		n/a	Capital House, Vint	Government of Indonesia	Bancolumbia, ProCredit

Source: Adapted from IFC, 2019

Note: CapEx, capital expenditure, figures in US\$

In India, which faces severe housing shortages but where over 60% of new housing is still self-built, IFC has been scaling up an approach to finance green self-built housing. Based on IFC's surveys, home owners in India experience thermal discomfort due to poor design and specifications, high utility expenses, combined with power and water disruptions. Green developer-built housing had been taking off, but challenges still remained on how to bring scale to the self-built market. IFC pioneered an approach that simplified the green eligibility while still preserving credibility. This included simplifying technical requirements, increasing awareness, and simplifying the certification process. Part of the process was creating a prescriptive list of green measures that still met green certification standards that the building be at least 20% energy efficient compared to the local baseline. The key

CASE STUDY 10

Nedbank, South Africa



IFC and Nedbank collaborated on the pioneering green residential development bond in Africa. The bond, totaling US\$120 million equivalent, included many layers of collaboration, awareness, and technical assistance. Training and awareness with developers is happening through a partnership with the South Africa Green Building Council. Through Nedbank, IFC is providing performance-based incentives and advisory services for both the developers and the bank, funded by the IFC-UK Market Accelerator for Green Construction program (MAGC). Additionally, Nedbank cross-sells the green homes through preferential rates for green mortgages, funded by the bank's own accounts. The ability to finance both construction and mortgages means that the bank can maximize its loan program while keeping risks low. Building on the success of this project, IFC committed a 7-year senior unsecured loan of US\$200 million to Nedbank in March 2025.

feature of India's market is the Housing Finance Companies (HFCs), that are set up to support mortgages for self-built homes, which IFC was hoping to green. As of March 2025, IFC has partnered with 6 housing finance companies in India to create a value proposition in the affordable housing segment of beneficiary-led construction of green

homes. The project has generated significant interest among financial institutions in India, with over 1600 homes in the pipeline, with 400 homes certified till date. Local certification agencies in India, including GRIHA and IGBC have also recognized the importance of this segment and have launched their own certification processes for self-built housing, amplifying IFC's position as a market creator.

There are many additional reasons that banks, funds, and REITs are embracing sustainable buildings. These benefits include:

- **Enhanced ESG standing:** Investors can use readily available tools to capture projected reductions in carbon emissions for certified projects, which can be used in institutional reporting for shareholders, regulators, and the public. One such tool is IFC's EDGE.
- **Lower investment risk:** Sustainable buildings and their buyers and renters represent a higher-value, lower-risk asset to maximize returns and increase profitability.
- **Portfolio opportunity:** Utilizing free assessment tools, investors can gradually switch their entire portfolio of buildings on a green or even a net zero emissions pathway, with certification documenting and verifying achievements and benefits.
- **Brand recognition:** Realize the investment potential of green buildings while establishing an identity as the "green investor" of choice.
- **New product offerings:** Investors can introduce innovative products to include sustainable construction finance and green mortgages, which attract new clients and customers.
- **Increased market share:** Win a greater share of the market by being the first mover in innovative financing using the products described above that respond to the direction the market is heading.
- **Simplified compliance:** Utilize freely available tools to verify benefits and easily report achievements on a portfolio basis.

CASE STUDY 11

FirstRand Bank, South Africa

IFC and FirstRand Bank partnered on South Africa's first transaction targets for green residential mortgages for women. The US\$250 million financing package, committed in May 2024, supports FirstRand Bank's expansion of its EDGE-certified green building construction financing and green mortgage portfolios, with specific carve-outs: at least 50% of the green mortgage financing is directed to affordable housing and 20% to women beneficiaries. Performance-based incentives—jointly funded by the MAGC and BMWK programs—will support developers and home owners. IFC is also providing advisory services to strengthen FirstRand's internal capacity and developer partnerships, with a focus on EDGE certification and technical support. In FY25, FirstRand started building a project pipeline and launched targeted impact reporting. In addition, IFC and FirstRand have begun a new phase to help medium-sized developers bring certified green housing to market.

120 See <https://edgebuildings.com/marketplace/banks/>



3.1 Investor Business Case Illustrated through Case Studies



Absa is actively involved in green building initiatives for several key reasons, driven by a commitment to sustainability, meeting stakeholder expectations, and accessing international green finance. As disclosed in their Sustainability and Climate Report in 2023,¹²¹ real estate is the largest financial balance sheet exposure for Absa and a focus for data analysis and partnerships. As expectations grow regarding corporate responsibility and sustainability, Absa recognizes the need for transparency, consistency, and tangible action. Green building initiatives help meet these expectations and build trust with customers, communities, and shareholders. While driven by environmental and social goals, green buildings also offer financial benefits, including reduced operational costs (energy and water), lower maintenance expenses, and potentially higher occupancy rates. All these provide Absa with better portfolio clients. Absa, in turn, can offer innovative funding solutions to facilitate these projects. One such innovative partnership was with IFC through the UK Government funded MAGC (Market Accelerator for Green Construction) Program. Part of the US\$236 million by IFC was a performance-based incentive that Absa is able to pass on as a rebate payment for eligible developers and homeowners to partly offset the incremental greening and certification costs tied to green building construction.



MACQUARIE

FIBRA Macquarie states that sustainability has become a core part of

their business as they are preparing their portfolio to be more resilient for a challenging future where climate change and social dynamics will be sources of uncertainty for their investors and clients.¹²² FIBRA Macquarie's corporate commitments through their sustainable-linked finance has led to a 15 bps reduction on interest rate from IFC on the US\$150m closed during 2024, and a 5 bps reduction working with other banks. FIBRA Macquarie recognizes that their industrial clients increasingly prioritize sustainability, and owning eco-efficient buildings aligns with their goals through a more differentiated portfolio. In summary, FIBRA Macquarie's focus on green buildings is driven by a combination of environmental responsibility, enhanced business performance, meeting customer needs, realizing financial benefits, mitigating environmental risks, and aligning with their broader ESG commitments.



Sustainability has been fundamental to **Asia Green Real Estate** since its establishment in 2009. The company believes sustainable buildings create environmental, social, and economic value

for all stakeholders, particularly through: higher sales prices, higher rental rates, lower vacancy, lower operating cost, lower life-cycle cost, and lower policy risks.¹²³ Asia Green attracts investors into its funds in part through a high GRESB rating. GRESB is a leading platform for real estate ESG disclosure that investors can use in order to make their financial decisions. Asia Green was named a GRESB Regional Sector Leader with a 5-start rating, placing it in the top

¹²¹ Absa (2023).

¹²² FIBRA Macquarie (2023).

¹²³ Asia Green Real Estate (2023).

quintile of all GRESB participations and solidifying its position as a benchmark for sustainability in the Asian real estate sector.

NEPI ROCKCASTLE

As a developer and owner of real estate, **NEPI Rockcastle** uses its green and sustainability-linked financing framework to attract impact investors. According to the company's disclosures, €1 billion in green bonds have been issued under the Green Finance Framework to finance or refinance existing and future projects.¹²⁴ The company's Sustainability-Linked Finance Framework is guiding future initiatives, with €795 million in loan facilities secured from development finance institutions like IFC but also from commercial banks such as Citi, Deutsche Bank, and HSBC.¹²⁵



Aavas and IFC partnership for green self-built homes allows the housing finance company to pass on a 0.5% interest rate reduction for green certified homes, provided through the MAGC Program in order to catalyze the greening of a vast underserved market in India. Development Finance Institutions (DFIs) like IFC have had long standing programs to catalyze local green finance, which are available to investors and developers in many emerging markets.¹²⁶



The construction sector in **Colombia** has transformed toward a sustainable buildings future in just a few years.¹²⁷ While sustainable buildings can take off even in the absence of supportive policies, private initiatives have contributed to the advancement of sustainable buildings, Colombia illustrates how a robust and coordinated policy environment can significantly accelerate and scale market transformation. In 2015, the national government enacted guidelines for water

and energy savings for buildings and soon after introduced tax incentives for technical solutions such as insulation and energy-efficient air conditioning systems to facilitate the financial viability of these new practices, a policy that was welcomed by the private sector. Colombia's Green Taxonomy was launched in 2022 and further clarified financial eligibility for green and sustainable buildings. The financial sector responded enthusiastically. In 2016, Bancolombia became the first bank in Latin America to issue a green bond in the amount of COP 350 billion (\$115 million) – and the green bond was exclusively earmarked for green buildings. The bank provided loans for green construction at between 0.5% and 2% less than conventional market rates by using its own resources alongside the proceeds of the green bond. The more measurably green the project was, the better the financing rate. Bancolombia was joined by Davivienda as the two first banks in the region to issue green bonds, with subsequent sustainable issuances in the primary market. Other commercial banks in Colombia followed, offering green financial products in the construction sector (including Bancolombia, Davivienda, BBVA, Banco Bogotá, and Caja Social), making Colombia one of the most empowering financial environments for green building investment in the region. Banking has accelerated green building market transformation by encouraging all business segments and project sizes to add green certification to their real estate investment projects. The results have been a sea change – in 2025 Colombia celebrated 20 million m² of real estate certified with the EDGE program.

¹²⁴ NEPI Rockcastle (2023).

¹²⁵ *ibid.*

¹²⁶ Climate Bonds Initiative (2024).

¹²⁷ Andrade (2021).



3.2 Chapter 3 Key Messages

- There are six drivers of sustainable buildings adoption, with well-documented case studies in this Guide and elsewhere:
 - Minimized incremental cost through early planning;
 - Faster sales, higher rents, and other benefits through market differentiation;
 - Savings on utility bills for owners and renters;
 - Lowered default rates for investors;
 - Fiscal or non-fiscal government incentives; and,
 - Access to international green finance flows for better financing terms.
- For the investors, the added value of sustainable buildings offers a possibility for financial innovation and new products, with the opportunity to cross-sell across developer finance, green mortgages, green products (such as solar panels, batteries, cooling equipment, etc), and accessing the capital markets. Differentiation with green products can also lead to increased market share.
- Both financial institutions and real estate developers and owners are accessing green bonds and sustainability-linked finance to raise funds for their projects. Access to international green finance flows is leading to benefits such as green bond oversubscription, access to new investors, and interest rate reductions through SLF frameworks.
- Green borrowers have lower default rates, leading to better portfolios for financial institutions. Sustainable buildings and their buyers and renters represent a higher-value, lower-risk asset to maximize returns and increase profitability.
- There is also strong data evidence for correlation between sustainability and private equity real estate returns.
- Financial institutions and real estate borrowers can differentiate themselves through their ESG standing, attracting impact-minded investors through disclosure platforms such as GRESB.
- While sustainable buildings can take off even in the absence of strong government policies, a combination of green building codes, fiscal and non-fiscal incentives, and a green taxonomy can catalyze the market adoption greatly.



EcoGreen Hotel – Hospitality in Vietnam

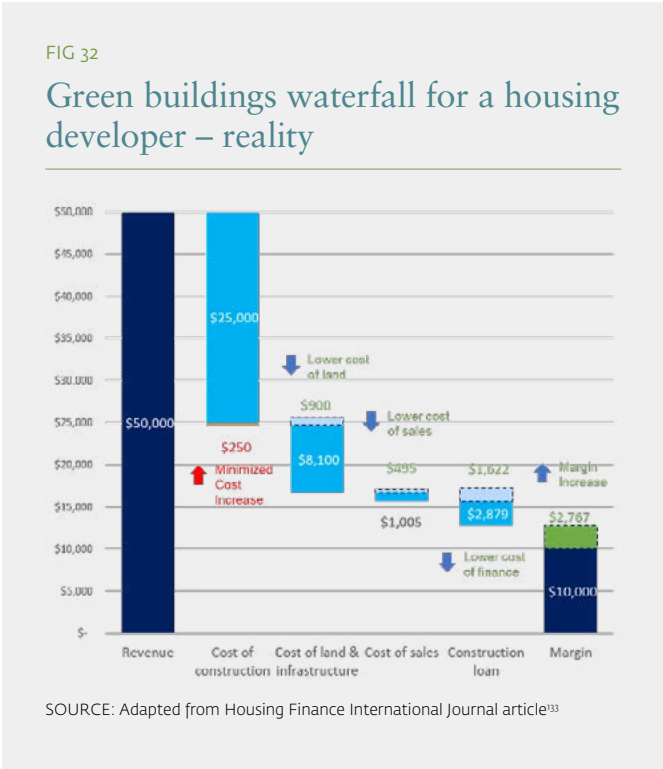
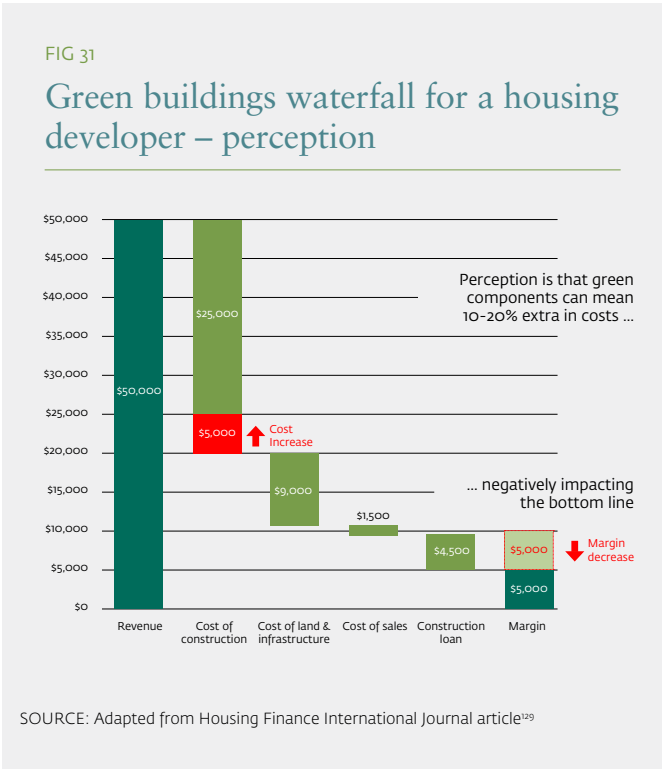
4

Commercial Value of Sustainable Buildings: *Why* the Developers and Property Owners *Will* Care

Many developers believe that sustainable buildings do not make returns and only eat into their profit margin, but experience shows that investing in sustainable buildings makes multiple returns. Take, for example, a typical residential developer in emerging markets. As shown in Figure 31, on an apartment sold for US\$50,000, this developer spent about half on cost of construction, up to 20% on the cost of land, about 3% on the cost of sales, and about 10% repaying the construction loan, leaving a margin of 20%.¹²⁸ The perception is that green components add 10-20% in additional costs, negatively impacting the bottom line.

IFC has found that the incremental cost of construction can be radically minimized, to around 1% of total costs, and offset through multiple benefits. Deeper information supported by case studies is available in articles such as “Green innovation

for long-term affordability,”¹³⁰ “Building the business case for green affordable housing”¹³¹ and “Can Africa afford green and resilient housing?”¹³² For example, developers are reporting faster speed of sales on green properties, resulting in faster repayment of their construction loans, and an even greater reduction in the cost of financing. Government incentives for height bonus density (as mentioned in the earlier example of BBVA Peru) can effectively lower the cost of land per unit, by allowing more units to be built on the same plot. Marketing partnership through green certification for early pioneers of green construction can lower the cost of sales by leveraging the World Bank Group brand during sales promotion. Many banks (such as Bancolombia and Nedbank, mentioned earlier) are incentivizing green construction through discounted financing rate. All of these benefits can add up to developers’ margins actually increasing, as shown in Figure 32.



¹³⁰ Cairncross and Naicker (2020).

¹³¹ Musić (2021).

¹³² Musić (2023).

¹²⁹ Musić (2023).

The benefits accrue for projects in the commercial and industrial sectors as well.

These include higher rental incomes and lower vacancy rates, production differentiation including through transferring value to clients, re-channeled operational savings, and more. For example, Ghana's Atlantic Tower attracts multi-national clients through green certification while maintaining capacity rates of nearly 100%. Peru's LatAm Logistics Properties leaned heavily into its sustainability branding to quantify the value proposition while attracting industrial customers. In the hospitality industry, the "Business Case for Sustainable Hotels" report documents many benefits to hotels, including: 1) boosting profit margins through utility savings, 2) increasing revenue through satisfying customer preference and reducing reputational risk, 3) future proofing investment strategies, 4) safeguarding against regulatory risk and benefitting from incentives, and, 5) increasing value and validation through certification.¹³⁴ Finally, the Mother and Baby Hospital in Ghana calculated that the operational savings from energy efficiency and renewable energy – moving away from costly diesel back-up generators to demand-side measures with solar power – can pay for the entire cost of construction of

the hospital over the period of 20 years.

Perception of cost remains much higher than the reality.

The main challenge to green building adoption is that developers still see the costs as prohibitively high, with options available only to high-end properties or in industrialized countries. However, IFC's experience shows that reaching at least 20% resource efficiency can be achieved with about 1% in additional costs. IFC's approach is to educate the developers and their architects to incorporate passive measures at the time of design, minimizing the need for more costly technology interventions. For example, smaller windows or external shading are cost-effective strategies particularly in warm climates that prevent the sun's heat from unnecessarily warming the interior space while still allowing plenty of light in. A combination of smart passive design and carefully chosen technology interventions have enabled IFC's partners to reach 20% efficiency with just 1% in additional costs, as Figure 33 shows.¹³⁵ The additional costs may rise with additional efficiency ambitions, but the return on investment also increases, as we will see below.

FIG 33

Perceptions of incremental green costs are much higher than the reality

PERCEPTION: Very high incremental costs, 20-30% additional

REALITY: Less than 1% of total costs

IHS South Africa	Less than 1% of total costs
VINTE Mexico	About 1% of total costs
CAPITAL HOUSE Mexico	1% of total costs



¹³³ Musić (2023).

¹³⁴ World Sustainable Hospitality Alliance (2020).

¹³⁵ IFC (2019).

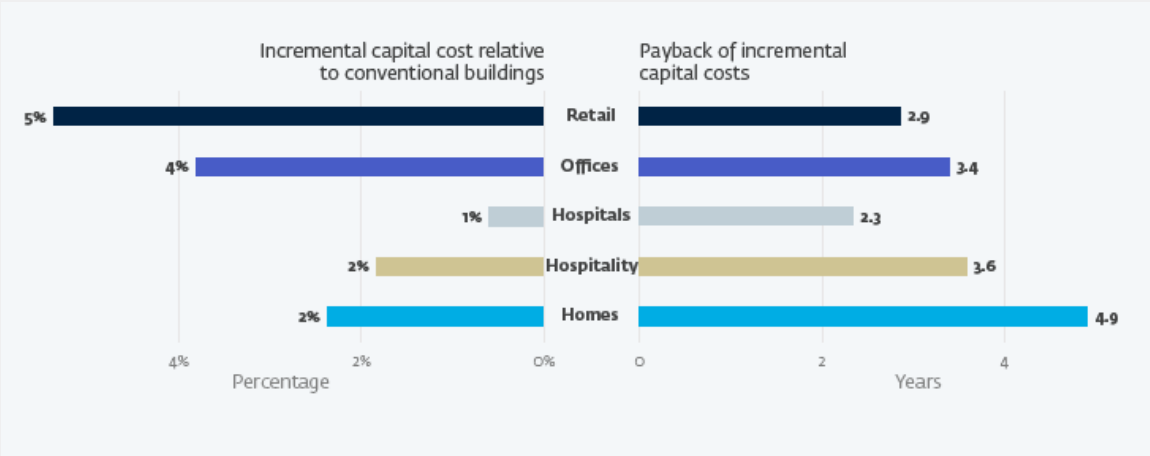
Incremental costs vary according to building type and location, but always show an attractive return on investment (ROI). IFC’s analysis suggests that the average incremental capital expenditure for some green buildings can range from 1 to 10%, but is always offset by savings in utility costs and results in a short payback period. On average, the ratio of incremental cost to conventional cost is largest, at 5%, for retail buildings and smallest for hospitals (with hospitality, home, and offices falling somewhere in between). Hospitals also had the shortest payback period (at almost two-and-a-half years), while homes had the longest payback period at up to five years, as shown in Figure 34.¹³⁶ While this data shows averages, developers can use IFC’s free tools to assess their own building and understand: 1) best measures to utilize for their particular building type, in their particular climate, 2) calculate estimated upfront costs, and, 3) calculate the return on investment via simple payback ratios.

Incremental costs are returned in part through lowered energy bills. As seen in Figure 34, savings in utility costs result in very attractive payback periods for building owners. In Jordan, the King Hussein Business Park spent about US\$23,000 retrofitting their office building for energy and water efficiency, but this resulted in US\$14,000 in annual savings, with a payback period of less than 20 months.¹³⁷ In Europe, the Schwarz Group is certifying about 10,000 of its Lidl and Kaufland retail stores. In their portfolio of stores in Bulgaria, operational savings is resulting in US\$2 million savings annually, with the payback period of about 2 years.¹³⁸



FIG 34

Upfront costs vary but are always offset by an attractive payback period



NOTES: Incremental capital costs are the ratio of incremental cost over typical construction cost.
SOURCE: IFC based a sample of IFC EDGE internal project data.

¹³⁶ IFC (2023).

¹³⁷ IFC EDGE (n.d.).
¹³⁸ Sintali (n.d.).

In the residential sector, developers are recouping incremental costs through faster speed of sales.

Developers like Signature Global (India) and Capital House (Vietnam) have reported faster sales resulting in better cash flow and faster repayment of their construction loans.¹³⁹ Capital House reports reducing financing costs by 3% on an incremental investment of 1%, helped by a branding partnership with IFC and differentiation of their product in a crowded market.¹⁴⁰ In South Africa, International Housing Solutions reports its low-income renters save a whole month's rent each year from lower utility bills, and its green homes occupancy rates are higher than similar conventional homes it owns.¹⁴¹ IFC has analyzed the residential sector extensively in journal articles and presentations.¹⁴²

Return on investment can also come from attracting more clients.

NEO, a developer and operator of office space in Manila, pioneered the zero carbon approach becoming the first office portfolio in the world to achieve zero carbon portfolio certification. The developer commands both premium rental rates and low vacancies by attracting eco-minded office renters. The vacancy rate in Metro Manila stands at 18.9% while NEO's vacancy rates are less than 5%.¹⁴³ In the industrial sector, many local companies must respond to the commitments of international brands to decarbonize their entire supply chain. Vietnam's Regent Garment Factory achieved certification by targeting 28% energy savings through a combination of smart design and efficient systems.¹⁴⁴ As the European Union continues to ramp up its Carbon Border Adjustment Mechanism (CBAM), exporters



to Europe will need to adjust the carbon footprint of their products or face carbon penalties at the border.

Scale amplifies the financial rewards of green certification.

Funded with THB 120 million (US\$3.6 million), One Bangkok became Thailand's first LEED for Neighborhood Development Platinum-certified development in 2023, covering 1.83 million square meters with smart infrastructure earning WiredScore and SmartScore Platinum certifications.¹⁴⁵ The U.S. Green Building Council (USGBC) notes that LEED Platinum projects reduce energy use by 25–30%, potentially saving millions of THB annually across One Bangkok's vast footprint.¹⁴⁶ CBRE Thailand highlights that green-certified buildings in Bangkok command rental premiums of 5–10%, significantly boosting One Bangkok's revenue over 108 hectares of leasable space.¹⁴⁷ Sustainable design also cut One Bangkok's water use by 30% during construction, lowering initial costs.¹⁴⁸ One Bangkok's sheer scale magnifies these gains, demonstrating outsized economic returns.

Green healthcare thrives on patient trust and cost control.

With THB1 billion (US\$28 million), Bangkok Dusit Medical Public Company Limited (BDMS) is building the Bangkok International Hospital (BIH), a 38,500-square-metre, 172-bed facility. Green measures are expected to reduce energy use by 20–25%, saving BDMS THB 10–15 million annually at THB 4.5 per kWh¹⁴⁹ given hospital demands of 300–400 kWh/m².¹⁵⁰ Water savings of 30–40% add THB 1–2 million yearly for BDMS.¹⁵¹ In Thailand's medical tourism hub, BDMS enhances patient trust with BIH's green status, potentially increasing revenue by 5–10% through higher occupancy.¹⁵² This blend strengthens BDMS's bottom line and market position.

¹⁴⁰ Musić (2021).

¹⁴¹ Musić (2021).

¹⁴² See Musić (2023), Musić (2021), and Cairncross and Naicker (2020).

¹⁴³ IFC EDGE & Sintali (n.d.).

¹⁴⁴ Ibid.

¹⁴⁵ CBRE Thailand (2023).

¹⁴⁶ USGBC (n.d.).

¹⁴⁷ CBRE Thailand (2023).

¹⁴⁸ USGBC (n.d.).

¹⁴⁹ EGAT (n.d.).

¹⁵⁰ ENERGY STAR (n.d.).

¹⁵¹ USGBC (n.d.).

¹⁵² GlobalData (n.d.).

Renewable integration turns green design into a profit engine.

Funded via a Green Islamic Facility worth MYR1.1 billion (US\$254 million) from Maybank and OCBC, YTL Power is operating a green-certified data center that uses on-site solar power to serve Southeast Asia's digital market. Energy efficiency measures can cut energy use by cuts energy use by 20–25%, and solar offsets 10–15%, potentially saving YTL Power MYR 2–3 million annually for an estimated 10,000-square-metre facility (size assumed based on industry norms) at MYR 0.40 per kWh.¹⁵³ Rental premiums of 10–15% above MYR 50–60 per square metre per month¹⁵⁴ add MYR 1–2 million yearly for YTL Power. Tax deductions from Malaysia's Green Technology Financing Scheme can reduce YTL Power's costs by around MYR 5–10 million¹⁵⁵. Pairing certification with renewables transforms YTL Power's sustainability into profit.

Green prestige elevates property value in competitive markets.

With PHP 6 billion (US\$120 million), Arthaland ASEAN Green Bond finances BERDE 4-Star projects like Arthaland Century Pacific Tower (ACPT) and Cebu Exchange (CebEx). Reducing energy use by 20–30%,¹⁵⁶ is saving Arthaland PHP 13–17 million annually across Cebu Exchange's 108,000-square-metre GLA¹⁵⁷ at PHP 10 per kWh.¹⁵⁸ ACPT's rents, 10–15% above Manila's PHP 1,200 per square meter per month,¹⁵⁹ add PHP 5–6 million monthly for Arthaland across its 34,295-square-metre gross area.¹⁶⁰ Arthaland's prestigious green credentials enhance property value and returns in the Philippines' competitive market.

Diverse green investments spread risk and multiply gains.

With COP 650 billion (US\$213 million) across 2016 (COP 350 billion) and 2018 (COP 300 billion) issuances, Grupo Bancolombia Green Bond funded 385,000 and 69,000 square meters of certified construction, avoiding

76,000 and 65,600 tons of CO₂ annually. Energy savings of 20–30%¹⁶¹ could yield Grupo Bancolombia COP 14.6–21.9 billion yearly for 2016's portfolio, assuming an average tariff of COP 875 per kWh.¹⁶² Occupancy rates rise 5–10% in cities like Bogotá,¹⁶³ adding COP 2–3 billion in rent for Grupo Bancolombia, while an 8–10% resale value boost adds COP 50–65 billion.¹⁶⁴ Grupo Bancolombia's multi-sector approach maximizes benefits.

Energy savings fuel reinvestment in growing portfolios.

With COP 433 billion (US\$147 million) in 2017, Davivienda Green Bond supported dozens of green certified projects, cutting energy use by 16–46%¹⁶⁵. Rents 7–12% above Bogotá's COP 50,000 per square meter per month¹⁶⁶ further benefit Davivienda alongside housing sales cycles, which shorten by 20–30%. Davivienda is in a position to reinvest these savings and revenues, amplifying growth in a competitive market.

Green building certifications unlock substantial economic rewards through energy innovation.

Completed in 2014 for INR2.1 billion (approximately US\$ 33.7 million), Indira Paryavaran Bhawan became India's first net-zero energy government building, earning GRIHA 5-Star certifications for its 31,488-square-metre footprint powered by a 930 kWp solar array. The Ministry of Environment, Forest and Climate Change (MoEFCC) reports the building generates 1.43 million kWh annually, offsetting its entire energy demand and eliminating grid electricity costs at Delhi's commercial rates of INR 8–10 per kWh in 2023. Its geothermal cooling system, recognized by these certifications, reduces HVAC energy use by approximately 40%, contributing to its net-zero status. India's renewable energy incentives, including accelerated depreciation on solar investments, further lower its effective cost. By

¹⁵³ Tenaga Nasional Berhad (n.d.).

¹⁵⁴ Knight Frank (2023).

¹⁵⁵ MGTC (n.d.).

¹⁵⁶ USGBC (n.d.).

¹⁵⁷ Arthaland (n.d.).

¹⁵⁸ Meralco (2023).

¹⁵⁹ Colliers Philippines (2023).

¹⁶⁰ Skidmore, Owings & Merrill (n.d.).

¹⁶¹ USGBC (n.d.).

¹⁶² SSPD (2024).

¹⁶³ JLL (n.d.).

¹⁶⁴ Ibid.

¹⁶⁵ USGBC (n.d.).

¹⁶⁶ Colliers Colombia (2023).

integrating certified green technologies, Indira Paryavaran Bhawan exemplifies cost-effective sustainability and sets a standard for public sector efficiency.

In addition to new buildings, there are many benefits to retrofitting existing buildings in line with sustainable standards. Over 75% of existing buildings will still be in use by 2050. While they usually have poorer energy performance, science tells us that all buildings – new and existing – must be retrofitted in line with net zero emissions standards by 2050 or the world will not meet the targets set in the Paris Climate Agreement. A white paper guide by Sintali, released in collaboration with the Global Alliance for Buildings and Construction, explores how readily available tools can be used by owners and operators to bring their entire building stock to net zero in a quantifiable, transparent and streamlined manner, with benefits described in Figure 35.¹⁶⁷

Recognizing that green retrofits can be challenging, the white paper focuses on actionable steps, including:

1. **Evaluate** the state of your current building or portfolio of buildings using readily available tools and benchmark your buildings;
2. **Identify** the efficiency measures you can implement with the quickest return on investment;
3. **Map** out the steps you need to take, and how much it will cost, to reach zero carbon for your asset or portfolio of assets;
4. **Validate** your progress to leverage green financing opportunities from leading financial institutions;
5. **Scale** your efforts across a portfolio of buildings in a resource-effective way.

FIG 35

The Benefits of Retrofitting Buildings



SOURCE: Decarbonising Existing Buildings.



4.1 Developers' and Property Owners' Business Case Illustrated through Case Studies

In addition to their strategy to differentiate themselves to investors through enhanced ESG ratings, **NEPI Rockcastle** has embraced sustainable buildings in part due to well documented financial benefits. The reduced energy costs make NEPI Rockcastle's properties more attractive to potential tenants, thereby boosting occupancy rates and net income. In their 2024 Annual Report,¹⁶⁸ NEPI Rockcastle shared the following data points:

- 13.2% increase in net operating income, fundamentally driven by higher tenant sales, allowing NEPI Rockcastle to raise base rents and collect more turnover rent (up by 15% versus 2023).
- While raising their base rates, NEPI Rockcastle's occupancy cost ratio ("OCR") has remained at the same sustainable level since 2022, demonstrating their success in working collaboratively with retailer partners to create and share value together.
- Their efforts to make their properties more attractive for both retail brands and consumers – in part due to sustainability efforts – has brought vacancy levels down to 1.7% across the portfolio.

NEPI ROCKCASTLE

Another reason is to lower energy costs through both demand-side and supply-side

measures. In 2024, NEPI Rockcastle paid around €30 million each month for electricity costs in its Romanian projects.¹⁶⁹ Installing photovoltaic panels on the roofs of its

27 projects in Romania, reaching an installed capacity of 38MW, generated revenues of €7.3 million in the first nine months of 2024. NEPI Rockcastle is now looking to cover its electricity consumption exclusively from renewable sources by the end of 2026.¹⁷⁰



MACQUARIE

Similar to NEPI Rockcastle, **FIBRA Macquarie** is both a developer and a property

owner, using leasing arrangements with their industrial tenants. In addition to attracting investors with their sustainability strategy (which was covered in the previous chapter), FIBRA Macquarie is also able to create shared value with their tenants. For example, Mexico is seeing very attractive rates for rooftop solar, providing a triple win for the investors (in the form of returns), a win for the FIBRA's industrial tenants (in the form of lower electricity bills), and a win for the environment. FIBRA Macquarie works with tenants under a green lease, sharing benefits with their tenants and collecting data on energy and water usage which will inform future collaborations. Their green lease strategy appeals to tenants who are attempting to comply with broad sustainability commitments, worrying not just about their Scope 1, but also Scope 2 and Scope 3 emissions. Their flagship facility in Monterrey was developed in part to attract nearshoring companies for the North American market. The facility was the first LEED® Platinum warehouse certified as LEED®v4 C&S in North America, achieving a

¹⁶⁸ NEPI Rockcastle (2024).

¹⁶⁹ Property Forum (2024).

¹⁷⁰ Property Forum (2024).

world record score of 90 points for industrial properties. The project achieved a 10.4% USD yield on cost, generating a 70% gain on investment of US\$9m and an unrealized unlevered IRR of 28.2%, showing that superior ESG design standards can translate into superior financial returns.¹⁷¹



In **Absa Group's** case, one of their first forays into green finance – the Absa Eco Home Loan program – was a result of a collaboration with a developer. Balwin Properties, a housing developer in South Africa, announced the world's largest ever homes certification commitment, at the time registering 16,000 homes for green certification with EDGE. Balwin has since registered over 39,000 units and received certification on over 27,000 residential units. For Balwin, the commitment aligns with their "Building Better Futures" strategy, attracting the rising number of buyers and tenants who are environmentally aware and/or those who want to save on lowered utility bills. According to the Bank's Eco Home Loan website, the Eco Home Loan provides a rate concession of 0.25% on the variable interest of the home loan and a rebate of up to 3% of the loan amount (paid in stages as the developer certifies the development). On a Rand 1,000,000 mortgage loan (equivalent to US\$57,150), homeowners could save up to Rand 109,968 (equivalent to \$US6,284). That is almost 11% of the total value of the loan, before additional utility savings.



Asia Green Real Estate provides its project partners their sustainability expertise and technical assistance as part of the incentive to build green. In-house experts combine local execution

capabilities with international perspective and a strong investment and sustainability discipline, allowing the investor to navigate the complexities of real estate development in various Asian markets. In addition to utilizing international green certification, Asia Green has a proprietary Eco-Tool which helps them identify opportunities for improvement.



In **Colombia**, building green certified buildings has become a norm rather than an exception. IFC's theory of change for green buildings, informed by the theories of adoption of new technologies, states that when enough of the market starts building green – usually around 20% – the market players will start demanding sustainable buildings rather than seeing them as an outlier. In Colombia, favorable government policies, green investment taxonomies, commitment from local banks, and technical assistance provided through CAMACOL, the national chamber of construction, all led to the sea change toward a more sustainable market.



Aavas provides incentives to its customers for self-built homes, helping to offset any incremental costs of green construction. The process for checking green compliance has been vastly simplified, relying on a simple prescriptive list of measures that homeowners can implement fairly easily, combining passive design and active measures. Aavas also provides customers with the expertise and information needed to make informed choices about green building materials and technologies, ensuring they can create a sustainable and comfortable home.



4.2 Chapter 4 Key Messages

- Developers believe that sustainable buildings do not bring returns because the incremental cost of construction is too high. In reality, perception of cost is much higher than reality and the investment into sustainable construction shows attractive returns on investment.
- Returns can come in many forms: lowered energy bills for owners of buildings including through renewables integration, faster speed of sales for home developers, attracting more buyers and renters with higher rates, and many more. Benefits are similar across many sectors, including residential, office, retail, healthcare, industrial, data centers, etc.
- In addition to new buildings – where incorporating sustainability elements can be quite easy at the design stage – there are many benefits to retrofitting existing buildings in line with sustainability standards. IFC's partner Sintali has released a white paper in collaboration with the Global Alliance for Buildings and Construction which explores how readily available tools can be used by owners and operators to bring their entire building stock to net zero in a quantifiable, transparent, and streamlined manner.

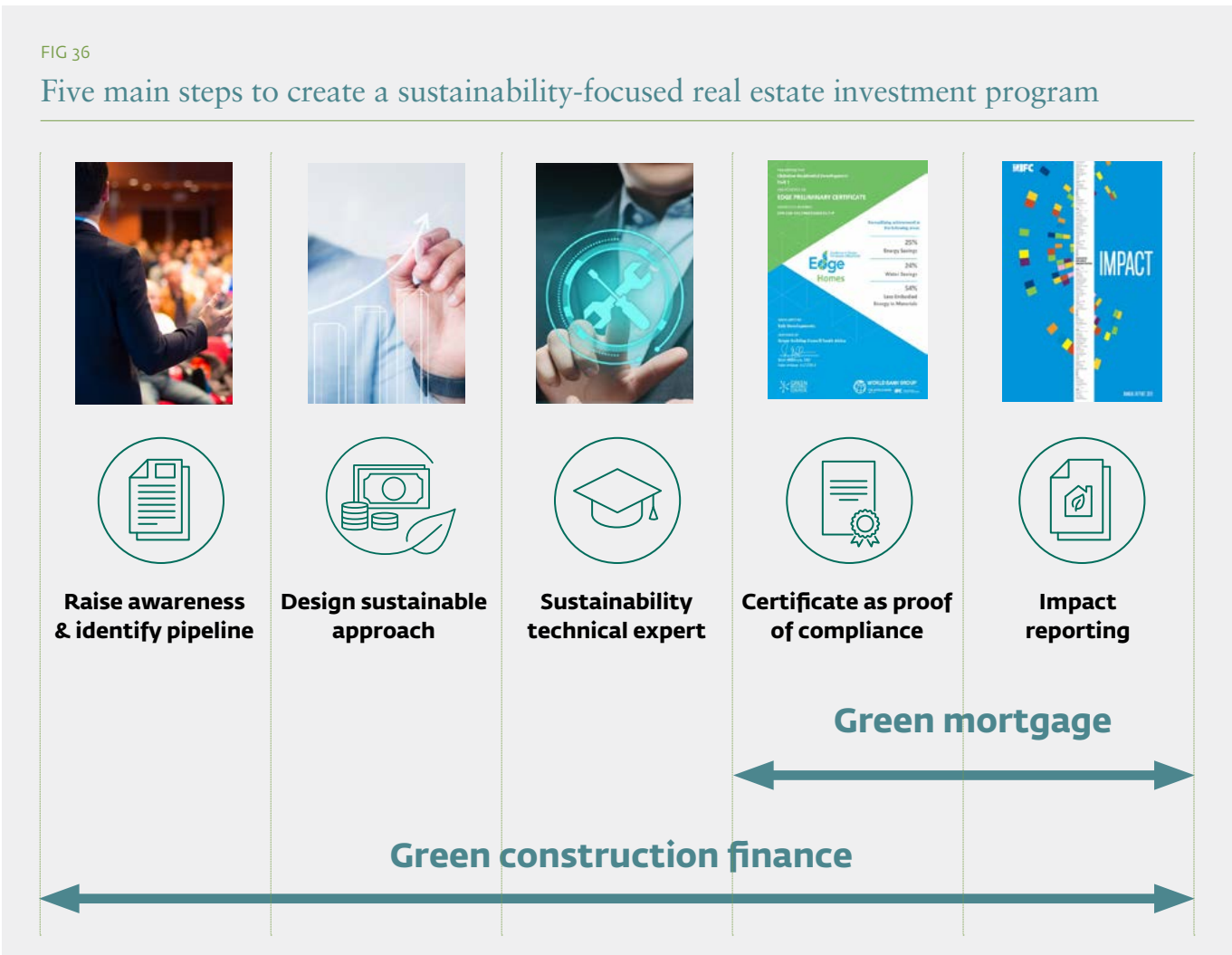
5

Steps to Create *a* Sustainability-Focused Real Estate Investment Program

Financial institutions looking to create a sustainability-focused real estate investment program can follow a journey of five key steps. It is important to note that due to the obstacles in sustainable building adoption identified earlier, simply launching a new investment product without awareness building and market creation will not necessarily result in market uptake. Awareness building, technical assistance, and a well-designed financial product are key to a successful launch.

This guide recommends following these steps, illustrated in Figure 36, which will be elaborated with case studies below:

- 1. Raise awareness and identify pipeline;
- 2. Design sustainability approach;
- 3. Deploy a technical expert for sustainability assessment;
- 4. Rely on certification as a proof of compliance;
- 5. Report impacts.



5.1 Step 1 – Raise Awareness and Identify Pipeline

Awareness building around benefits of sustainable construction is a crucial first step due to low penetration in many emerging markets. As shown throughout this guide, there are many benefits to sustainable construction, but the actual penetration of sustainable practices is quite low in many emerging markets. Examples like Colombia showcase that the right combination of awareness building, enabling environment, and access to finance can catalyze the market. Awareness building helps to overcome barriers like lack of knowledge and perception, fostering a broader acceptance and demand for sustainable building technologies and materials. Awareness campaigns, technical assistance programs, and demonstration projects can help companies understand the benefits, such as reduced energy and water consumption, improved indoor air quality, and lower operating costs. As shown earlier, developers often have misconceptions about the cost and complexity of sustainable building, with technical sessions helping to demonstrate that sustainable construction can be cost-effective and practical. Eventually, awareness of benefits creates demand for more sustainable options, incentivizing developers and financiers for action.

In order to build awareness, companies should hold sustainable building “discovery workshops” with their clients and implementation teams. Well before creating a sustainability framework, piloting a transaction, or creating a full investment program, IFC recommends

that companies educate all of their stakeholders on the financial and environmental benefits of sustainable buildings. Primarily, investment institutions looking to create a sustainable program will need to hold awareness workshops with their developer clients, in order to create buy-in and induce demand. However, developers and property owners may also choose to hold company-wide awareness workshops, in order to bridge the gap between sustainability officers and budget decision makers. The purpose of such a workshop is to educate all the about the benefits of sustainable construction explained earlier in this Guide. When an investment institution organizes the workshop, it's best to have both the investor's staff and their developer clients both in the same room, to connect both the demand and supply of sustainable finance. Development finance institutions like IFC can assist the partner banks, funds, and REITs to develop co-branded invitation materials and to develop a tailored workshop. One of the benefits of a program like EDGE is that investors can not only gain insight into projects under development by its existing clients, but can also be connected to new projects seeking funding. As seen in Figure 37, EDGE allows developers to share their information, serving as a matchmaker between financiers and projects seeking financing. Other organizations such as GRESB, UNEP (especially through their arm UNEP FI), PEEB, and the Climate Bonds Initiative provide similar services, with screen shots displayed below.

Sustainability-focused programs can connect the investors to new projects seeking funding



[Welcome](#)[Products](#)[Insights](#)[About GRESB](#)

 [PORTAL LOGIN](#)

How we support you

GRESB is your strategic partner for sustainable investments across real assets in climate-critical industries. Together, we facilitate productive engagements between investors and managers, helping organizations comply with regulations, define best practices, and demonstrate leadership so they can build more resilient, efficient, and financially attractive portfolios for long-term success.

INVESTORS

Institutional investors, asset owners

Investors request access to GRESB data and use analytical tools to monitor portfolio- and asset-level risks, opportunities, and impacts and to engage with their investment managers.

[Find out more](#)

MANAGERS

Companies, fund managers, asset operators

Managers and asset operators use GRESB to measure, benchmark, and improve the performance of their portfolios and assets. Some choose to share their data to attract and engage investors.

[Find out more](#)

PARTNERS

Consultants, solution providers, industry bodies

Partners offer their consulting services and business solutions to both investors and managers to advance sustainable investments.

[Find out more](#)

FIG 37 CONTINUED

Sustainability-focused programs can connect the investors to new projects seeking funding

PARTNER LOGIN

EN | 中文

ABOUT | STANDARD | CERTIFICATION | CLIMATE FINANCE SOLUTIONS | MARKETS | POLICY | TAXONOMY | TRANSITION FINANCE | CLIMATE BONDS RESILIENCE PROGRAMME | RESOURCES | GET CONNECTED | EVENTS

Climate Finance Solutions / Technical Assistance Services

Technical Assistance Services

Navigating Sustainable Finance

Climate Bonds' Capacity Building and Technical Assistance team guides potential debt issuers through the initial steps required when issuing climate-related labelled bonds and other similar forms of debt.

We specialise in supporting governments, cities/municipalities, national development banks, and corporate issuers. We also assist asset owners and managers in developing investment methodologies that reinforce science-based criteria addressing the challenges of climate change and its impact on society. Climate Bonds is a leading standards setter of internationally recognised sector criteria that are science-based and aligned with a 1.5-degree pathway, while playing a fundamental role in the development of most global and national taxonomies currently in place.

Furthermore, we are one of the primary database sources for all climate-related themed bond issuances, where we curate, analyse, and review bond issuances. This provides us with a deep understanding of current market trends and best practices, enabling us to offer guidance on industry-level benchmarking.

This wealth of experience and expertise has been instrumental in advising governments, regulators, and policymakers on effectively promoting sustainability. Our insights and understanding of what motivates governments and international investors position Climate Bonds well to collaborate with potential issuers in navigating taxonomies, sustainable principles, transition guidance, and sector criteria.

The Partnership ▾ Programmes ▾ Knowledge Hub News

OUR WORK

PEEB uses a unique combination of financing and policy to bring ambitious projects for energy efficiency and resilience to scale and achieve long-lasting sector transformation.

Investment Facility

Supporting large-scale construction projects

Project preparation and design

Project investment funding

AFD (public sector clients)
PROPARGO (private sector)

Enabling Facility

Policies and capacity for the buildings transition

Sectoral investment frameworks

Public policies

Capacity building

Knowledge

GIZ

CASE STUDY 12

Banco Pichincha, Ecuador

Ecuador's Banco Pichincha is one of the earliest EDGE Champions, a part of an elite group of investors and firms which committed to a substantial portion of their real estate portfolio to be certified as green. In 2019, IFC invested US\$150 million in the bank's first green bond, which was also a first for the country. A part of the use-of-proceeds was earmarked for green construction and green mortgages. To help spread awareness about green construction, the Bank held discovery workshops to educate its developers about the business opportunity and to reward early developers with incentives. The Bank accepted BREEAM, EDGE, and LEED certifications, but decided to incentivize developers by covering the EDGE certification fee for smaller projects and appointing a free EDGE Expert and EDGE Auditor, along with covering the certification fee, for larger projects. After the first round of workshops, the Bank reported over 100 projects identifying as looking for green financing in Ecuador.

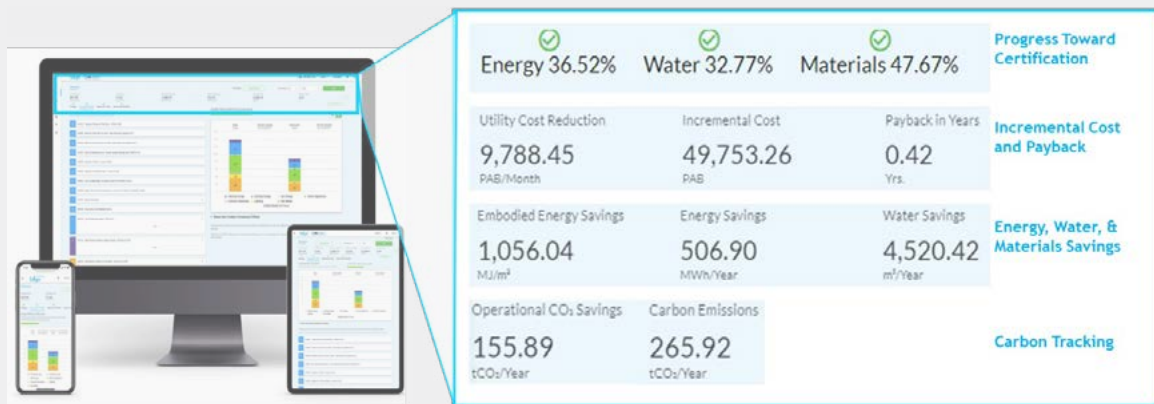
Financial institutions and developers looking to launch a green bond on the capital markets should create a Green Bond Project Team (GBPT). As described in IFC's "Green Bond Framework," a green bond – a specific instrument organizations can engage through capital markets – is a strategic financing in that it signals an organization's transition journey and sustainability strategy to the wider world. The process leading up to issuance needs to be carefully managed to make sure that the issue is both a financial and strategic success.¹⁷² IFC recommends creating a team, which includes representatives from Treasury, Sustainability, Loan Administration, Origination or Business Development, IT, Reporting, Investor Relations, and Legal. Each of these teams may need to understand the business case for sustainable construction and fully buy into the strategy.

Financial institutions in particular should build their investment pipeline by engaging a select group of developers, offering technical assistance to analyze live projects on a 1-1 basis. The Sustainable Building Discovery Workshop will introduce the resources and the business case, but the developers will need to see sustainability specifications for their particular projects in order to switch from brown to green construction. IFC recommends that the investor choose 5-10 of its largest developers, in order to offer technical assistance on their projects. Using a system such as EDGE, a trained technical expert can work with developers on a live case study of a building project seeking or about to seek financing. The technical expert would engage the developer on a discussion of most sensible measures in the local climate that would make the building meet the sustainability criteria, all the while calculating incremental cost and payback period, as well as estimates for the total construction costs. The example of green analysis is displayed in Figure 38, while resilience analysis is displayed in Figure 39.

172 IFC (2020).

FIG 38

Green Analysis for the Project



SOURCE: EDGE

1000133221, SAN JOSE

CINDE

LEED ID+C: Commercial Interiors (v4)

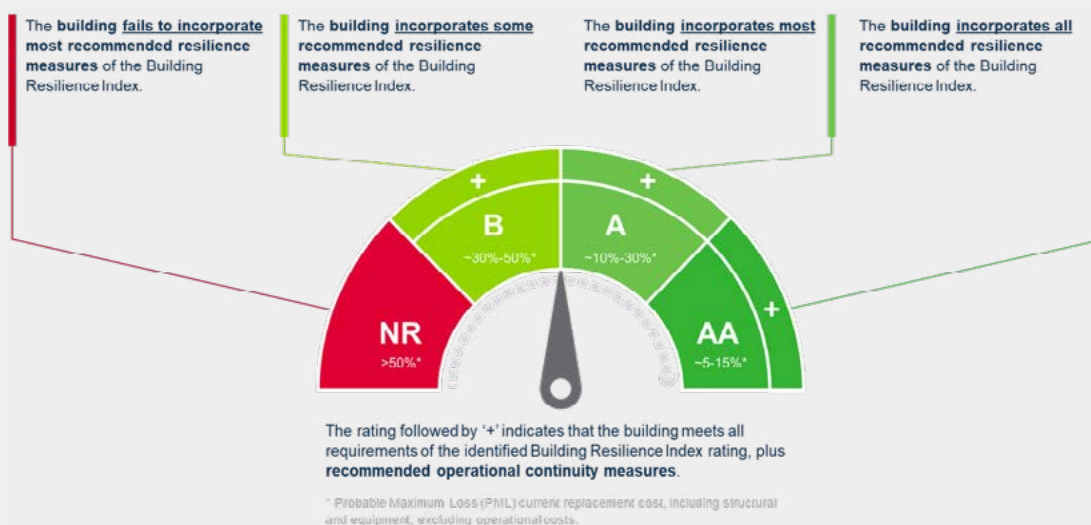
GOLD, AWARDED MAR 2021

WATER EFFICIENCY AWARDED: 12 / 12 Prereq Indoor water use reduction 0 / 0 Credit Indoor water use reduction 12 / 12	INDOOR ENVIRONMENTAL QUALITY AWARDED: 4 / 17 Prereq Minimum IAQ performance 0 / 0 Prereq Environmental tobacco smoke control 0 / 0 Credit Enhanced IAQ strategies 0 / 2 Credit Low-emitting materials 2 / 3 Credit Construction IAQ Mgmt plan 1 / 1 Credit IAQ assessment 0 / 2 Credit Thermal comfort 0 / 1 Credit Interior lighting 0 / 2 Credit Daylight 0 / 3 Credit Quality views 1 / 1 Credit Acoustic performance 0 / 2
ENERGY & ATMOSPHERE AWARDED: 21 / 51 Prereq Fundamental commissioning and verification 0 / 0 Prereq Minimum energy performance 0 / 0 Prereq Fundamental refrigerant Mgmt 0 / 0 Prereq Minimum Energy Performance (2024 Update) 0 / 0 Credit Enhanced commissioning 0 / 5 Credit Advanced energy metering 1 / 2 Credit Renewable energy production 0 / 3 Credit Enhanced refrigerant Mgmt 0 / 1 Credit Green power and carbon offsets 0 / 2 Credit Optimize Energy Performance (2024 Update) 0 / 25 Credit Optimize energy performance 30 / 35 Prereq Energy performance metering path REQUIRED	INNOVATION AWARDED: 6 / 6 Credit Innovation 5 / 5 Credit LEED Accredited Professional 1 / 1
MATERIAL & RESOURCES AWARDED: 4 / 13 Prereq Storage and collection of recyclables 0 / 0 Prereq Construction and demolition waste Mgmt planning 0 / 0 Credit Long-term commitment 0 / 1 Credit Interiors life-cycle impact reduction 0 / 4 Credit Building product disclosure and optimization - environmental product d... 1 / 2 Credit Building product disclosure and optimization - sourcing of raw materials 0 / 2 Credit Building product disclosure and optimization - material ingredients 1 / 2 Credit Construction and demolition waste Mgmt 2 / 2	REGIONAL PRIORITY CREDITS AWARDED: 2 / 4 Credit Enhanced commissioning 0 / 1 Credit Renewable energy production 0 / 1 Credit Optimize energy performance 1 / 1 Credit Daylight 0 / 1 Credit Indoor water use reduction 1 / 1
	LOCATION & TRANSPORTATION AWARDED: 16 / 20 Credit LEED for neighborhood development location 0 / 18 Credit Surrounding density and diverse uses 8 / 8 Credit Access to quality transit 7 / 7 Credit Bicycle facilities 1 / 1 Credit Reduced parking footprint 0 / 2
	INTEGRATIVE PROCESS CREDITS AWARDED: 2 / 2 Credit Integrative process 2 / 2
TOTAL 67 / 110	

SOURCE: LEED

FIG 39

Resilience Analysis



SOURCE: BRI

Property owners may engage in a similar exercise, building awareness with their teams and engaging with their tenants, in order to discuss schemes such as green leases or reduction of Scope 1 and 2 emissions.

Property owners with minimal or no decarbonization strategy can use the “discovery workshops” in order to bring together the sustainability and finance officers. In follow up workshops, the outputs may include a preliminary baseline emissions inventory, initial decarbonization strategy, and near- to mid-term plans with costs and benefits. Property owners who have more robust decarbonization strategies can engage in harder-to-scale barriers to portfolio decarbonization, including tenant engagement, scope 3 inventory, supply chain engagement, best practices for on- and off-site renewable energy generation as well as carbon capture, storage, and utilization. IFC’s program GRIP (Greening Real Estate Investment Portfolios) can help developer and property owners through this journey, focusing on two tracks depending on the client’s maturity.

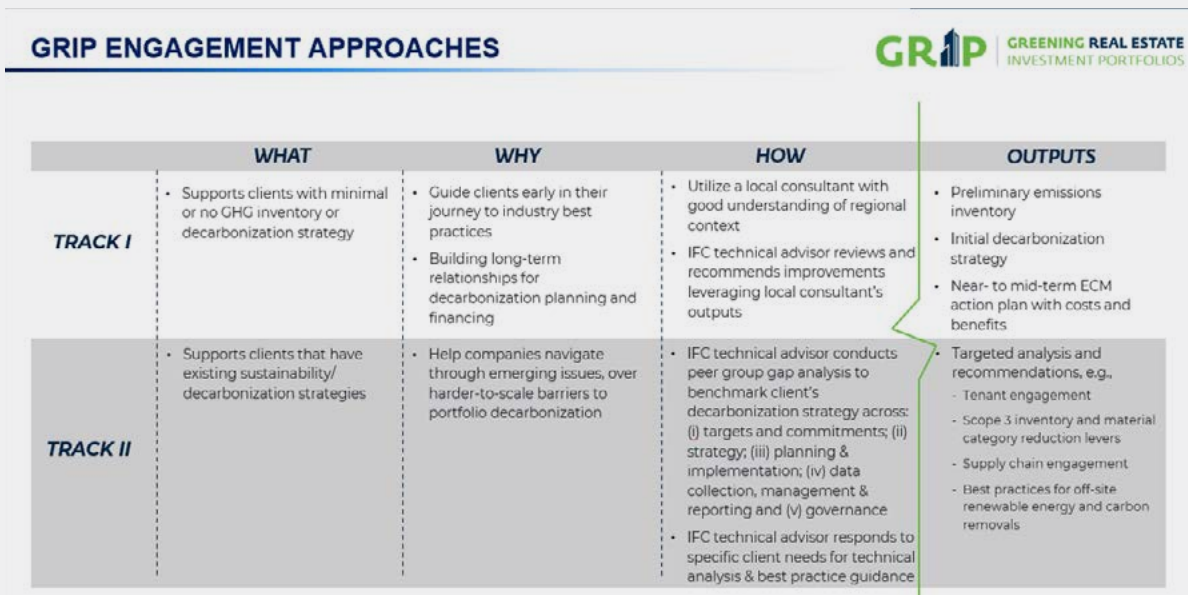
For retrofits, scenario modeling will allow the building owner to plan actions for a single building as well as a portfolio of assets.

Over 75% of existing buildings will still be in use by 2050. They usually have poorer energy performance and contribute exceptionally high levels of greenhouse gas emissions. “Decarbonising Existing Buildings: Guide to Green Retrofits with EDGE” sets out a process for companies to evaluate, plan, implement, and scale their portfolio retrofit plan.¹⁷³ A key step for the plan includes scenario modeling, which can be adjusted and re-run utilizing free tools such as EDGE. The scenario modeling can help aggregate improvements into categories, evaluate the impact of different types of improvements, and create an implementation plan on a time horizon from light to deep retrofits, as seen in Figure 41.

173 Sintali.

FIG 40

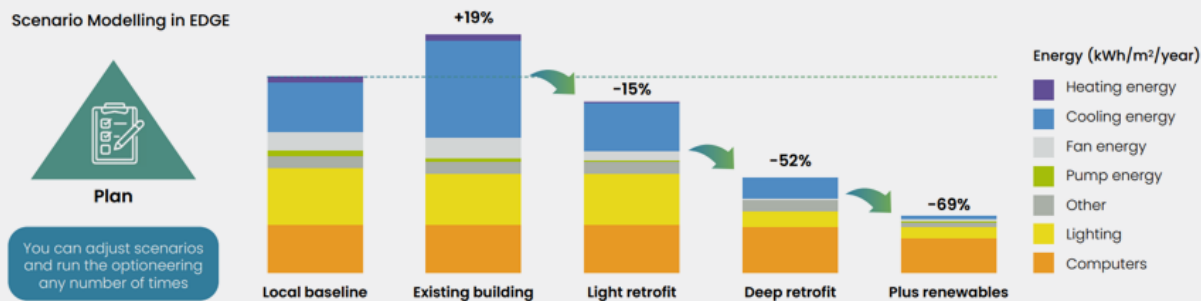
GRIP Program engagement



SOURCE: GRIP

FIG 41

Scenario Modeling for Retrofits



SOURCE: Decarbonising Existing Buildings

The outcome of the initial awareness workshop and technical engagement is a greater comfort in a solid funding envelope. At the end of the exercise, the investors will have engaged 5-10 developers, each of which can have 2-3 real projects for analysis. Property owners can do a portfolio analysis for their existing and projected portfolio. In each of the cases, technical experts can put together a first draft of the cost/benefit ratio and a funding envelope,

showing a timeline of projects that could be financed by green products in the near future. This type of a near-term funding envelope and project pipeline gives investors confidence that if they put in the resources to develop a green program and raise green financing, they would be able to readily deploy it. With the confidence gained in Step 1, organizations can then more confidently go into Step 2 where more analysis is needed.

Step 1: Raise Awareness and Identify Pipeline					
What	Create Sustainability Project Team	Introductory “Discovery Workshop”	Match-make investors and developers	Technical Analysis on a set of real projects	Consider portfolio process
Why	Best practices for organizations looking to launch a sustainable labeled finance program	Introduces in-house and client teams to the benefits of sustainable buildings	Creates additional reach of willing partners toward a robust investment pipeline	Gives comfort to project teams that assets can be greened in a financially sustainable way	Plan how to decarbonize existing portfolio over time for greater impacts
How	Follow steps described in IFC’s Green Bond Handbook. Ensure representation from various teams, for example from both retail and corporate banking sides, in order to cross-sell the sustainable product.	Work with one of the existing programs to design and execute the workshop, and to connect investors and developers, including for example: • EDGE • Building Resilience Index • Climate Bonds Initiative • GRESB • PEEB	Use “upstream” process, with combined advisory and financing package. • See, for example, IFC’s GRIP program for developers and MAGC for banks. Hire consultants, using directories such as: • EDGE Experts • LEED APs • GreenStar APs Train in-house team using platforms like: • EDGE training • BRI training • LEED training • GBCSA Academy	Use Decarbonising Existing Buildings – A Guide to Green Retrofit with EDGE for a step-by-step retrofit planning guide	

CASE STUDY 13

CIB Bank, Egypt



The Commercial International Bank (CIB) in Egypt secured a significant US\$100 million investment from IFC, which marked a milestone for Egypt as it initiates its inaugural green bond program. In addition to the financial support, IFC deployed technical assistance to

the bank's clients which facilitated the development of an investment pipeline that aligns with environmentally responsible practices, and thus enabled the issuance of the green bond. CIB (with the support of IFC) lead the Green Building finance market capacity development by organizing training sessions, and green building experts' certification programs to engineers, consultants and real estate sectors professionals (including CIB own team). IFC's team worked with the Bank's developers to understand projects seeking financing and showing the developers how they can transform them to comply with the green criteria. CIB's headquarters has earned EDGE certification, showing its stronger commitment to green building efforts. For more in-depth information on this noteworthy development, refer to the [CIB article](#).



5.2 Step 1 Illustrated through Case Studies

Asia Green Real Estate promotes green building awareness through a multi-pronged approach that includes tenant engagement, proprietary green building tools, and strategic partnerships. They actively educate tenants on sustainability practices and leverage their EcoTool to assess and improve properties, ensuring they meet or exceed market sustainability standards. Asia Green also collaborates with organizations like IFC to enhance green building certification and they use tools such as GRESB to disclose their impact and attract other investors.

Aavas promotes green homes through both institutional and community-based outreach. They participate in forums such as those organized by Habitat for Humanity and have organized road shows in cities across India. They use various channels like brochures, manuals, social media, blog articles, press releases, and audio-visual films to promote green homes. For example, their Facebook social media presence boasts 209,000 followers. Aavas partnered with IFC to organize seminars through the "Green India Drive" to bring together regional stakeholders and discuss green structures and financing.

Absa's foray into sustainable buildings started as a partnership with one of their clients Balwin Properties, who co-created with Absa their incentivized finance to home buyers who choose green properties. Since then, the bank has expanded their value proposition to include a performance-based incentive for both developer and end-users Absa has also committed to certifying its own buildings demonstrating its commitment to green building practices and providing a tangible example for clients.

NEPI Rockcastle prides itself on three pillars of its local community engagement, promoting community wellbeing, environmental responsibility, and community education.

NEPI Rockcastle integrates environmentally responsible practices across all its operations and development, encouraging everyday action at both individual and corporate levels. The Group works closely with tenants and business partners to raise awareness, promote eco practices, and drive collective support for environmental sustainability in all regions it operates. This community approach can in part explain their strong financial performance and ability to charge premium rents while keeping vacancies low.

FIBRA Macquarie was the first Mexican real estate participant to be recognized in the Green Lease Leaders program¹⁷⁴. This program encourages collaboration between landlords and tenants to achieve sustainable practices within the properties. FIBRA Macquarie guides customers from their first visit to the property through the lease signing, move-in, and operation. They offer a strong supplier network for customer-led renovations, encouraging tenants to make sustainable improvements to their space. They also collect tenant water and energy consumption data to identify areas for improvement and engage with tenants on how to enhance their ESG management.

As mentioned earlier, **Colombia** had a multi-faceted approach for promoting sustainable buildings that included water and energy savings guidelines, tax incentives, partnerships with international organizations, as well as a certification program administered by the Colombian chamber of construction CAMACOL. One of the first initiatives included "road shows" by Bancolombia, which educated its developer clients on the benefits of green buildings. The local universities also signed on to offer the "Design for Greater Efficiencies" course, aiming at training future architecture and engineering professionals with a vision to design and build edifications that are efficient with the planet's natural resources.



5.3 Step 2 – Design Sustainability Approach

With comfort of a near-term funding envelope and project pipeline, financial institutions and developers and property managers can set the task of designing the appropriate sustainability approach. For example, the organization may decide to pilot just one transaction, or they may launch an entire sustainability framework, as seen in examples discussed in this report. A commercial bank, for example, must think through whether the target sector is commercial, industrial, residential – or a combination thereof. Each of these sub-sectors of real estate comes with its own specific business models that require nuance in communication and education. For both investors and property owners, sustainable building products do not have to be specific to construction, but could also include a range of technologies – solar rooftop and battery, among other – through both outright purchase and leasing structures. Companies have an opportunity to securitize their portfolio of existing buildings, and issue green bonds for new construction or for securitization on local or international markets or via private placement. Each of these steps will be explored in detail below.

Whether starting with a pilot transaction or a formal framework, organizations should start by defining clear goals, scope, and sustainability focus. In order to understand the purpose behind the financial transaction, organizations should ask themselves questions such as: Why are you launching a green building program? What specific environmental, economic, or social benefits do you hope to achieve? What is the level of efficiency we are hoping to achieve: certified, advanced, or net zero? In order to understand scope, ask questions such as: Will this program apply to new construction, renovations, or both? Will it focus on residential, commercial, or mixed-use buildings? Will we focus on construction only or also look into renewable

energy – on-site and/or off-site? Can we monetize carbon credits? Global organizations may also ask themselves what country or countries they want to focus on. A country where a more mature sustainable construction program has taken off may be an easier target, but a country with a more nascent program could offer a possibility for capturing greater market share. Finally, organizations should ask themselves questions such as: Are we ready to commit to company-wide targets? Or should the program focus on use-of-proceeds and specific assets? What types of sustainability should I focus on: green, resilient, nature-based, circular economy – or some combination thereof?

For investors, partnerships with developers are key, especially for green mortgages. In addition to the questions above, commercial banks must also decide whether to focus on the supply side (developer finance) or demand side (green mortgages) of sustainable construction. Under a green mortgage, a bank or mortgage lender offers a house buyer preferential terms if they can demonstrate that the property for which they are borrowing meets certain environmental standards. Green mortgages can be made available at the time of the unit purchase or through a retrofitting done by the home owner after the purchase. In the former case – responding to emerging markets where much of the housing stock is still being built – launching green mortgages requires the supply side – green residential construction. The bank may decide to cross-sell its product, providing both construction finance and green mortgages. In the least, a promotional partnership with developers is necessary to create green housing stock.¹⁷⁵ The reason for

¹⁷⁵ In very few cases IFC has seen, the local public policy created the stock on its own, without the need for intervention by the financial markets. This was the case in Peru, described in the Box 1 on Bank BBVA. While this case study is in theory replicable elsewhere, IFC has not seen it repeated on the same scale as in Peru.

this need is that in formal residential construction, it will be the developers that receive the batch of green certificates, which they then issue to buyers at the time of their purchase contract. The buyers can then bring this certificate to their mortgage officer. Programs like EDGE uniquely address the residential market as the certification is issued not only on the level of the building, but also on the level of each residential unit. The certificates are individually numbered with a unique number as well as description of the unit, allowing the bank to develop a green mortgage product.

For investors, designing sustainability-focused

financial products typically necessitates building in market incentives to catalyze adoption. The obstacles to sustainable building adoption have been well documented, meaning that developers will seek incentives in order to switch their construction practices to include sustainability criteria. However, incentives can at times be quite simple, with the market receiving the needed push through training, free audit or certification, or in-house technical assistance. At other times, the investors may need to provide a more robust incentive reflected in lowered interest rate or other financial benefits to the developers. However, these incentives should be seen as a return on investment, resulting in lowered default rates, greater market share, or green marketing benefits, as discussed in previous sections. Many IFC partners are already providing fiscal and non-fiscal incentives, as seen in Figure 42.

FIG 42

Selected investor-led incentives for sustainable buildings

Banco Pichincha • 0.1% lower interest rate • 50% of certification costs covered • Training	Banco Promerica • 0.5% lower interest rate • Extended grace period and tenor • Training	Procredit • 0.5% lower interest rate • Technical assistance • Extended tenor • Training	Asia Green Real Estate • In-house technical assistance	
Internal Housing Solutions • Training and technical assistance	Reall • Preferential finance • Training, auditing, certification	IFC – MAGC • Preferential finance • Training, auditing, certification	Global Climate Partnership Fund • Technical assistance • Auditing	
Preferential financing	Technical training	Technical assistance	Subsidized auditing	Subsidized certification

FURTHER RESOURCE: EDGE website for Banks

FIG 43

Select profile of banks offering incentives for sustainable construction in emerging markets



CASE STUDY 14

MAGC - Market Accelerator for Green Construction

The goal of the UK-sponsored MAGC program is to boost the uptake of greener practices and technologies focused on developing countries' construction markets. The program utilizes a range of financial instruments designed to maximize impact by blending concessional finance provided by the UK alongside IFC's commercial finance, based on market need, barriers and the principle

of using minimal concessionality. The instruments include interest rate buy-downs, principal repayment forgiveness, subordinated loans, and risk-sharing facilities. Alongside IFC's finance, the Program provides technical assistance to both the partner bank and their developer clients, as well as country-level capacity and awareness building.¹⁷⁶

¹⁷⁴ See [MAGC program information from IFC website](#).

Investors that decide to offer fiscal incentives should reward performance-based initiatives.

A number of investors may decide to offer fiscal incentives, either for use-of-proceeds or target-driven approaches. In either case, we recommend performance-based incentives that reward achievement of certification. A potential risk with sustainable construction is that the developer will not follow on the commitment made to the investor, and instead switch to regular construction. This is one of the reasons certification is the best way to verify achievement of commitment. Certification is typically available first on design and then on post-construction, as-built asset. In the case of use-of-proceeds schemes, investors can deploy a standard loan structure with the developers and utilize an incentivized rate only once certification has been achieved, at least on the design stage. Target-driven finance depends on achievement of company-wide results and can include both incentives for successes and penalties for non-achievement.

For property owners, green lease structures, awareness training, and “hand-holding” can be a way to deploy incentives for their tenants.

Launching a green lease provides numerous benefits for landlords and tenants, including cost savings, improved building value, and positive environmental impact. Green leases encourage collaboration and align the interests of both parties toward sustainability goals, leading to more efficient building operations and lower utility costs. Green Lease Leaders provides a step-by-step guide, including lease negotiations, tenant fit-out, and tenant operations.¹⁷⁷ Property owners that provide assistance to their tenants and work with communities – as shown in the examples of FIBRA Macquarie and NEPI Rockcastle – have great successes in ability to charge higher rents but keep vacancy rates low.

Banks also need to develop internal system to properly process and record sustainable loans. IFC can deploy training to the bank’s loan officers on how to set up internal

systems that will ensure loan processing is compliant with green criteria. For example, the green certification usually serves as a trigger that unlocks any incentivized tranches of green finance. IFC’s Climate Assessment for Financial Institutions (CAFI) tool is a web-based platform to help financial institutions identify, track, and report climate-related investments in line with international standards. CAFI offers a comprehensive, web-based platform that supports climate finance institutions by providing a one-stop solution for climate eligibility, impact assessment, and reporting for green buildings finance transactions across mortgages, construction finance, and retrofits. CAFI is integrated with EDGE and can pull impact data directly once Banks upload EDGE certificates. It includes real-time analytics and a centralized portfolio view for Banks to track their disbursements and impact. IFC also provides training on CAFI to equip financial institutions with the skills to effectively assess, tag, and report green buildings transactions.

Organizations ready to formalize their commitment can launch either a Green Bond Framework or Sustainability-Linked Finance Framework.

As explained in Chapter 2, green bond (and other sustainable bonds) is a “use-of-proceeds” instrument, while SLF is a “targets-driven” instrument for those ready for company-wide KPIs. Formally engaging in these instruments requires a framework spelling out either the use-of-proceeds categories or specified KPIs. Each of these was illustrated in the case studies at the end of Chapters 3 and 4 and will be repeated here at the end of Chapter 5. Use-of-proceeds and target-driven frameworks can be quite similar, though the former will focus on the origination and identification of eligible assets, while the latter will focus on setting material KPIs for the company. Both overlap in focusing on how the company will manage the proceeds and on how it will report on allocation and impact.

For companies and investors looking to launch a green bond, IFC’s “Green Bond Handbook” showcases a step-by-step process. One of the main messages of

¹⁷⁷ See [Green Lease Leaders](#) website.

this Guide is that both real sector companies and financial institutions in emerging markets are under-utilizing green bond and green loan mechanisms to finance sustainable construction. Emerging markets are lagging behind industrialized countries in amount of green financing going to real estate and they could be “leaving money on the table” by overlooking an asset that can quite easily be greened, as we saw from numerous examples and case studies. As we saw in Chapter 2 on Taxonomies, green bonds require 1) four initial steps that create the green bond framework: i) eligibility criteria, ii) project evaluation and selection, iii) management and proceeds, iv) description of reporting 2) an external review of the framework, 3) information for investors, and 4) annual impact report. Green building certifications, particularly quantitative applications such as EDGE, represent a straight forward way to “plug” into the green bond process. The four initial steps for the Green Bond Framework can be fulfilled through:

- Eligibility criteria – as we saw from our case studies, relying on international and locally-recognized certification is one of the easiest ways to comply with both national taxonomies (if one exists) and international green finance standards. This positions the green bond issuer to access both local and international green finance flows.
- Project evaluation and selection – similar to above, relying on certified projects pushes the burden of validation onto a credible third party partner. Green building certifications typically include a certification on both design and post-construction stage. Projects seeking financing can provide a design certificate as part of eligibility for financing.
- Management and proceeds relates to internal systems put in place to track allocation of proceeds and the temporary use of funds.

Step 2: Design Sustainability Approach

What	Define goals, scope, and sustainability focus	Choose Taxonomies	Partner with developers, mostly for green mortgages	Design incentives	If ready, launch a Sustainability Framework
Why	Balance ability to deploy in known areas vs. capturing early market share in new areas	Compliance with taxonomies can help organizations appeal to new investors	Investors need strong partnerships with developers who will create the sustainable stock	Investors can catalyze developers' adoption, and developers can do the same for tenants, through incentives, awareness, and TA	Appeal to investors and enjoy benefits of sustainable-linked finance incentives
How	Use “upstream” process, with combined advisory and financing package. See, for example, IFC's GRIP program for developers and MAGC for banks. Work with bodies such as PEEB	Use guides such as: ICMA Green Buildings guidelines EU Taxonomy BRI resilience disclosure Blue Finance Guidelines Biodiversity Finance Reference Guide Circular Economy Finance Guidelines	Continue iterative “discovery” process with developers using programs such as: EDGE Building Resilience Index Climate Bonds Initiative GRESB PEEB	See how investors are already launching both fiscal and non-fiscal incentives from EDGE website for banks Partner with IFC's MAGC program to deploy fiscal incentives through blended concessional funds Use Green Lease Leaders how-to guide	Utilize guides such as: Green Bond Handbook ICMA Guidelines for Sustainable-Linked Financing

CASE STUDY 15

Green bond framework for Acorn, Kenya

Acorn Holdings Limited is the premier developer, operator and asset manager of rental housing in Sub-Saharan Africa, and has been an established developer and manager of real estate for over two decades in East Africa. Acorn is now the largest institutional investor in rental housing, presently running purpose-built student accommodation in Nairobi, Kenya. In October 2019, Acorn issued Kenya's first Green Bond under a KES 5 billion note program, raising KES 4.3 billion (approximately US\$43 million). The bond was listed on both the Nairobi and London Stock Exchanges. In September 2021, it was upsized to KES 5.7 billion (US\$57 million) Medium Term Note program which was oversubscribed by 46%. The green bond was certified by the Climate Bonds Initiative under the ICMA green bond



principles. The proceeds were used to develop 8 green purpose-built student accommodation properties, which are IFC EDGE-certified. Acorn successfully redeemed the bond in October 2024, earlier than its maturity date in November.

Acorn's initial green bond framework is a simple 9-page document, of which 3 pages describe the company and the remaining 6 pages are the core part of the document. Acorn chose for its use-of-proceeds the construction of 6 yet-to-be-built student residences which were to be green certified. Acorn's success with the Green Bond demonstrates that not only financial institutions, but corporates as well, can access international green finance through green bonds via a relatively straightforward process. Acorn has continued to be active in the Capital Markets by establishing Real Estate Investment Trusts and continues to explore issuance of new Green Bonds in the future..

- Reporting – green certification systems, and in particular EDGE as the most quantifiably driven system, have systems to report impacts on both individual building and portfolio level.

Step 2, the external review of the framework, is also simplified if the issuer uses certification for compliance, rather than a list of technical measures that the second opinion provider need to check. As discussed in Chapter 2

on Taxonomies, all the case studies use certification for the technical equivalence. Step 3, the information for investors, is about the company and the type of bond it seeks and less about the green measures. Finally, Step 4 – annual reporting – is already explained in the earlier step. While some commercial banks may have more elaborate green bond frameworks due to their diversified portfolio, the frameworks can be quite simple for companies or investors focused on real estate only, as case study 15 shows.



5.4 Step 2 Illustrated through Case Studies



NEPI Rockcastle focuses on shopping centers across Central and Eastern Europe. The company started their sustainability journey through a 2020 use-of-proceeds Green Financing Framework and then expanded to the 2023 company-wide target-driven Sustainability-Linked Financing Framework. After focusing on demand side energy efficiency initiatives, the company is now looking into renewable energy to provide to its tenants.



Asia Green Real Estate works with both commercial and residential real estate across both Asia and Europe. Asia Green ensures compliance with European regulations aiming to increase transparency for sustainable investment products. They also use GRESB disclosure as a crucial tool for investors.



Aavas focuses on self-built homes in India. A key feature of their sustainability approach is the simplified green building certification compliance, developed in partnership with IFC. This allows them a more streamlined and ultimately more cost-effective certification process that still complies with international certification standards.



Absa Group finances a wide range of real estate, including commercial, residential, industrial, and mixed-use properties. With the ability to offer both developer finance and mortgages, Absa is in a position to cross-sell their finance across the value chain. Their Eco Home Loans is a differentiated product launched in partnership with developers. Absa's Sustainable Finance

Issuance Framework¹⁷⁸ includes sectors other than real estate, in line with a more diversified investment portfolio, and includes a list national, regional, and internationally recognized green building certifications.



FIBRA Macquarie focuses on industrial real estate in Mexico. Their Sustainability Linked Financing Framework was launched in 2023 and includes company-wide targets for green certification.¹⁷⁹ Similar to NEPI Rockcastle, FIBRA Macquarie initially focused on demand-side energy efficiency measures but has since diversified into providing tenants with renewable energy, thanks to favorable returns for solar investments in Mexico.



While Colombia's public policy guidelines for energy and water savings was wider-reaching across all areas of construction, its tax benefits were more focused, providing in the form of exemption of VAT (19%) and income tax deduction (25%) for project design services and technical solutions such as insulation and energy-efficient air conditioning systems. The local financial markets are working with green buildings across the value chain, with the ability to cross-sell between developer and mortgage finance.

¹⁷⁸ Absa (2023).

¹⁷⁹ FIBRA Macquarie (2023).



5.5 Step 3 – Deploy a Sustainability Expert

Alongside well-structured finance products, sustainable building adoption requires appointing a technical expert to help projects meet sustainability criteria. Experience shows that finance is not enough to move markets; but finance, combined with awareness and technical assistance can indeed be the catalyst that transforms an entire country (see, for example, the earlier case study of Colombia). This Guide recommends that the bank or fund appoint a technical expert who understands both sides of the coin: This person should be well familiar with green criteria, but should also know the investor’s loan process, and ensure that the green certification is in line with the loan time frame. The technical expert must work with each developer and his/her projects, ensuring green compliance information is collected at the right time.

There are several modes to deploy technical assistance. Development Finance Institutions may provide technical assistance to its clients as part of their overall investment. An in-house expert can be trained and

appointed directly by the organization. For example, Asia Green Real Estate trained its technical team using the EDGE program, so they may directly provide assistance to its projects across Asia. The expert can be independently hired, contracted directly by the organization from a global roster of accredited professionals. Some certification providers also provide an option for a master technical agreement with the investors, where projects undergoing certification receive free basic support (about 8 hours worth of expert work). In some cases, local technical experts are willing to do a free one-hour introduction to green certification to projects simply considering the green process, as a way to build their own business. Certification bodies behind programs such as LEED, EDGE, and others provide regular trainings and accredit professionals after they have passed a qualified exam. These experts can be embedded in the in-house technical team or operating as independent consultants and can typically work across multiple countries, providing advice and services to local projects.

Step 3: Deploy a Sustainability Expert		
What	Hire an Expert	Train In-House Team
Why	Ensure projects meet eligibility criteria, including for certification, in the same timeline as investment processing	
How	Hire consultants, using directories such as: • EDGE Experts • LEED APs • GreenStar APs	Train in-house team using platforms like: • EDGE training • BRI training • LEED training • GBCSA Academy



5.6 Step 3 Illustrated through Case Studies



Asia Green Real Estate provides in-house technical assistance to its client developers as part of the incentive to build green. In addition to utilizing international green certification, Asia Green has a proprietary Eco-Tool which helps them identify opportunities for improvement.



MACQUARIE **FIBRA Macquarie** utilizes external consultants for technical analysis and the certification process, but oversees their work through the Sustainability Committee. Part of FIBRA Macquarie's technical expertise comes through a relationship with IFC's GRIP program, through an iterative process that helps the company understand its baseline, set targets, upgrade existing properties and incorporate best practices in new build, and certifying their stock.



NEPI Rockcastle has a similar set up to Fibra Macquarie, with a dedicated Sustainability Department, staffed with professionals with qualifications in relevant fields like environmental engineering and sustainability management. The company uses independent authorized consultants to review and certify (or re-certify) their buildings.



Absa Group's sustainability work is overseen by the Social, Sustainability, and Ethics Committee (SSEC). The bank collaborates with external consultants for green building projects, including organizations like WSP in Africa. Absa's collaboration with IFC through the MAGC Program has unlocked donor funds to appoint technical experts for advice to every project as they undergo certification.



Aavas has an in-house team that provides technical expertise and guidance to help homeowners make informed decisions about sustainable building practices. This includes helping them choose sustainable materials and technologies.



In **Colombia**, technical expertise has evolved over the years. The initial banks, Bancolombia and Davivienda, collaborated with IFC through a holistic financing and advisory agreement, whereby IFC helped hire technical experts who became embedded within the bank and provided advice to every project undergoing certification. After this initial demand creation, with the green financing program taking off, the experts consultants market has matured. For example, as of June 2025 there were almost 200 EDGE Experts consultants providing services in the country, with additional training provided to the younger generation of architects and engineers through the "Design for Greater Efficiency" course administered by local universities.



5.7 Step 4 – Rely on Certification as Proof of Compliance

Certification is the best way to reliably communicate value between investors, developers, and end buyers or renters, because of the verification of benefits through a 3rd party.

It is not enough for a project to self-declare as green, because certain green measures (for example, insulation or better windows) are not visible to building users. This value is communicated through a certificate which should state energy and water savings compared to a local baseline. The requirement for the green certification should be embedded into the loan agreement between the investor and the borrower, with a time limit (for example 3–6 months) allotted to the developer to finalize the green certification on design specifications of

the building. Any incentives should also be deployed only at the time of the green certificate compliance. For example, if a bank is providing an interest rate incentive, the developer may first receive the normal tranche of funds, with the step down on interest rate in effect only once the project is certified. The investor can choose to back-date the previous tranche with the lower rate, or let the time stamp stand in order to incentivize the developer to more quickly obtain the certification. The certificate is also used as verification instrument for use-of-proceeds for instruments such as green bonds or green loans that the investors themselves are raising. Please refer to certification table (Figure 13 for details).

FIG 44

Sustainability certificates communicate value between investors, developers, and end users



Step 4: Rely on Certification as Proof of Compliance

What	Green Building Certification	Building Resilience Verification	Other Taxonomies
Why	Compliance with accepted certification programs ensures access to green finance and communicates value between investors, developers, and end users	Communicate value and improve financial standing with insurers	Certifications for individual assets do not yet exist, but third party verifiers can confirm compliance of company's framework with the standard
How	Utilize international and recognized national or regional certification systems such as the ones from the below (non-exhaustive) list: - EDGE - Green Star (in Africa via GBCSA) - IGBC - China Green Building Evaluation Standard - LEED - BREEAM - Estidama Pearl Rating System - DGNB - HQE	Utilize Building Resilience Index for disclosure and verification	Use third-party verifiers such as the ones from the ICMA External Reviewers List



5.8 Step 4 Illustrated through Case Studies



As we saw in Chapter 2, all of the case studies employ certification as a proof of compliance and best practice in creating and disclosing value between investor, developer, and end buyer or tenant.



As seen earlier in Chapter 2, in their Sustainable Finance Issuance Framework **Absa Group** recognizes regional, national, or internationally recognized standards or certifications and explicitly names Green Star, LEED, and EDGE (see Figure 26).



NEPI Rockcastle relies on the EU Taxonomy definitions or projects that are certified with BREEAM, LEED, EDGE, or HQE certification mechanisms.



Asia Green Real Estate uses its proprietary EcoTool for analysis but certifies its building with EDGE, LEED, WELL, Greenship, DGNB, or China's Green Building Label.



Aavas utilizes EDGE certification for self-built homes.



MACQUARIE

FIBRA Macquarie works with EDGE, LEED, and BOMA certifications.



Colombia's Green Taxonomy specifies certain technical achievements for eligibility but uses equivalence with international certifications (such as LEED and EDGE) and national programs (such as CASA Colombia).



5.9 Step 5 – Report Impacts

Impact reporting is important for regulatory reasons, as part of the sustainable finance framework disclosures, or to attract new investors. As we saw in Chapter 1, ESG disclosures, which detail a company's environmental, social, and governance performance, are becoming increasingly important in both industrialized and emerging markets. Some emerging markets are developing their own sustainable finance frameworks and disclosure regulations. For example, China has introduced ESG reporting guidelines for listed companies, aligning with international standards like the ISSB. Oman plans to make sustainability reporting mandatory for publicly-listed companies in 2025. European Union has been a leader in this space and organizations working with global players with operations in the EU are choosing to follow EU regulations even for their work in emerging markets. EU Sustainable Finance Disclosure Regulation (SFDR) mandates specific disclosures for financial market participants and financial advisors operating within the EU or selling products to EU investors.¹⁸⁰ The Corporate Sustainability Reporting Directive (CSRD) expands the scope of companies required to report on sustainability and strengthens the rules around reporting social and environmental information¹⁸¹. TCFD (the Task Force on Climate-Related Financial Disclosures) has become an accepted framework with recommendations for disclosure, now carried out by the IFRS.¹⁸²

Voluntary disclosure through a common platform can help attract impact-minded investors. In addition to disclosing impacts through their individual reports, organizations can also report through common platforms such as CDP or GRESB. Some of the main reasons to report

through peer comparison platforms include: 1) enhanced reputation and trust, 2) improved risk management, 3) access to capital through a standardized way to communicate with investors, 4) competitive advantage, 5) alignment with regulations and standards, 6) improved internal processes through peer benchmarking, 7) enhanced employee engagement and retention through transparency. CDP (formerly Carbon Disclosure Project) is a global disclosure platform for companies, cities, states, and regions to manage and disclose environmental impacts.¹⁸³ While CDP covers many aspects of the economy, GRESB (Global Real Estate Sustainability Benchmark) is a platform dedicated to real estate. Studies cited in Chapter 3 show that companies with a high GRESB score outperform their competitors.

Investors and developers accessing sustainable finance need to report impacts in line with harmonized guidelines. As shown in the discussion on green buildings definitions, there has been a harmonization of impact reporting on climate finance. Each project financed by the bank needs to calculate and disclose energy and water savings, as well as GHG emissions reductions. This information must be shared on a portfolio basis, but in the case of green bonds, needs to be disclosed for each project financed. Programs such as EDGE allow the investor to easily generate this reporting – on both individual project and portfolio level. In addition to sector-specific tools like EDGE, IFC has also launched tools that help investors complete their reporting across the different climate engagements. As illustrated in Figure 45, IFC's tool CAFI – Climate Assessment for Financial Intermediaries – enables loan officers to track data on the level of each of their projects, aggregating the data into a portfolio report harmonized with green finance categories.

¹⁸⁰ See the [EU website](#).

¹⁸¹ *ibid*.

¹⁸² See the [IFRS website](#).

¹⁸³ See [CDP website](#).

FIG 45

IFC’s CAFI tool helps investors track and report on their portfolio impacts

CAFI Loan Amount Distribution by Climate Category

Mn USD, May 2025

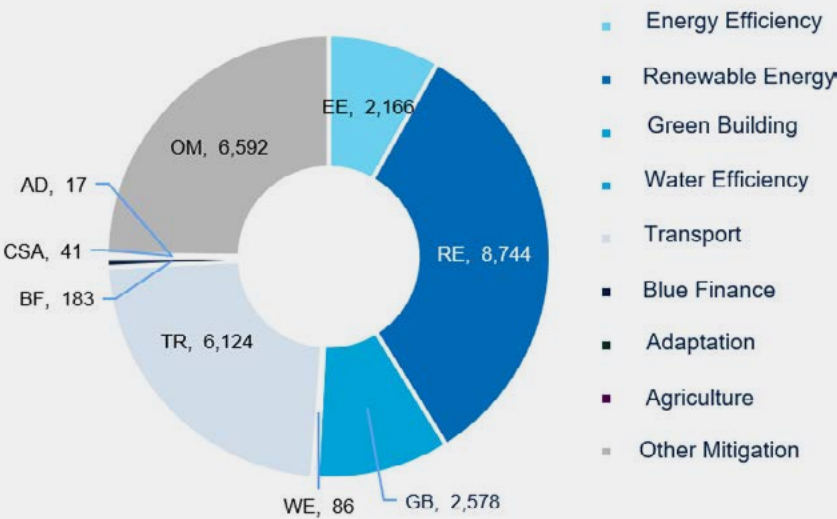
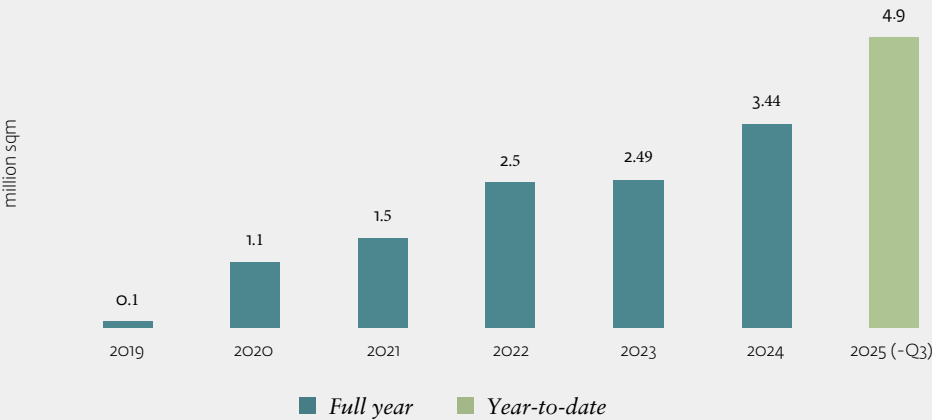


FIG 46

Financial Institutions have reported over 15 million sqm of certified floor space on CAFI



Many other software platforms assist companies in collecting, managing, and reporting ESG data, and facilitating compliance with reporting frameworks.

Some popular examples include:

- **Workiva:** A cloud-based platform supporting financial and ESG reporting, offering features for data integration, collaboration, and audit trails.
- **IBM Envizi ESG Suite:** A SaaS solution for consolidating enterprise ESG data, emissions management, and decarbonization.
- **Novata:** Specializes in ESG solutions for private markets, providing a platform for data collection, reporting, and insights.
- **Persefoni:** An AI-powered climate management and carbon accounting platform for measuring and reporting emissions data.
- **Coolset:** Tailored for mid-market companies, simplifying compliance and scaling sustainability efforts through features like emissions tracking, reporting, and carbon reduction planning.

When selecting a platform, consider factors like:

Regulatory alignment: Ensuring compliance with relevant framework.

- **Data collection and management capabilities:** Ability to consolidate and analyze data from various sources.
- **Stakeholder engagement features:** Facilitating collaboration and communication with internal and external stakeholders.
- **AI and automation features:** Streamlining reporting processes and enhancing data quality.
- **Scalability and customization options:** Adapting to the organization's evolving needs and industry specific requirements.
- **Accuracy and reliability:** Ensuring data integrity and audit readiness.

Step 5: Report on Impacts

What	Generate impact data for each asset financed	Report across the portfolio	Report to voluntary peer benchmarking platforms	Comply with regulations
Why	Comply with sustainability finance guidelines which require asset-level reporting	Comply with sustainability finance guidelines and also benchmark assets against each other	Attract investors and benchmark performance against peers	Ensure alignment with local regulation and with leading global frameworks
How	Utilize tools like energy modeling software, Building Information Modeling (BIM) software, and online calculators to generate impacts data. EDGE App is a one-stop-shop cloud software with an impact calculator, building modeling, and financial estimates.	Use EDGE App to generate portfolio-wide data. Use IFC's CAFI Tool to report across investment portfolio (beyond real estate). Use ESG software such as from the below, non-exhaustive list: • Workiva • IBM Envizi ESG Suite • Novata • Persefoni • Coolset	Utilize platforms such as: • CDP • GRESB	Find local regulations, including guidance through local sustainable taxonomies. If working with EU investors and companies, comply with EU regulations. Follow TCFD best practices.



5.10 Step 5 Illustrated through Case Studies



NEPI Rockcastle's sustainability strategy is monitored through comprehensive targets aligned with the material ESG risks and opportunities and disclosed in the sustainability section of its Annual Report¹⁸⁴. These targets reflect the foundation of the Group's commitment to reducing its environmental footprint and driving sustainable progress.



Asia Green Real Estate reports its impacts in part as a comparison of its portfolio to the peer group, utilizing available GRESB data¹⁸⁵. Across all measured metrics—energy intensity, GHG intensity, and water intensity—Asia Green boasts their performance significantly surpassing that of the peer group, with the objective progressively enhance this performance level, including through their net zero commitment.



Aavas' Sustainability Report¹⁸⁶ discloses the financier's actions to green its own operations and focuses the impact reporting on the first pilot transactions for self-built homes, with GHG, energy, and water savings as well as the cost savings for the home buyer.



As befitting a large, diversified commercial bank, **Absa Group's**¹⁸⁷ sustainability disclosure is the most complex of the case studies. It includes information on their strategy and governance, climate scenario testing, and then dives into financial allocation and impacts across their portfolio.



MACQUARIE FIBRA Macquarie has issued a robust ESG report which details their

achievements across the environmental, social, and governance categories.¹⁸⁸ Their Sustainable-Linked Financing Framework chose one specific KPI – proportion of green certified properties. However, their ESG Report discloses information in a number of categories, including data coverage, green building and green lease certifications, reducing resource consumption, and assessment of climate related risks and opportunities. They provide data on rooftop solar efforts, water scarcity, solid waste management, and impact on biodiversity.



The Government of **Colombia** has many ways it has been disclosing information about sustainable buildings, including through the Nationally Determined Contribution (NDC) mechanism and its National Roadmap for Net Zero Carbon Buildings. In addition, IFC has been assessing market maturity of green building adoption among several countries. Each country note summarizes key market indicators including policy environment, building construction, and green building certification and finance¹⁸⁹.

¹⁸⁴ NEPI Rockcastle (2024).

¹⁸⁵ Asia Green Real Estate (2023).

¹⁸⁶ Aavas (2024).

¹⁸⁷ Absa Group (2024).

¹⁸⁸ FIBRA Macquarie (2023).

¹⁸⁹ IFC (2023b).

FIG 46

NEPI Rockcastle Reporting Frameworks

ESG Topic	Target	Measurement	Progress in 2024	Aspiration for 2030
Climate change	Reduce energy intensity in common areas by 30% by 2030, compared to 2022 baseline	kWh/m ²	3% reduction in 2024 compared to 2023 9% reduction in 2024 compared to 2022 baseline	Operate an energy efficient portfolio
	Reduce scope 1 and 2 GHG emissions intensity per m ² by 80% by 2030, compared to 2019 baseline	tCO ₂ e/m ²	25% reduction in 2024 compared to 2023 85% reduction compared to 2019 baseline	Act for a low-carbon future
	Reduce scope 1 and 2 GHG emissions intensity per m ² by 40% over 2024-2030 compared to 2022 baseline	tCO ₂ e/m ²	66% reduction compared to 2022 baseline	Act for a low-carbon future
	Reduce absolute scope 3 GHG emissions from operations (within Category 3 and 13) by 25% by 2030, compared to 2022 baseline	tCO ₂ e	0.4% reduction compared to 2023 4% reduction compared to 2022 baseline	Stakeholder engagement for a low-carbon future
	Produce renewable energy for own consumption by 2030	Renewable production capacity	Produced renewable electricity, covers 6% of total Group electricity needs	Path to net zero
	Reduce embodied emissions from new constructions by 30% by 2030, compared to 2019 baseline	Upfront embodied carbon intensity kg CO ₂ e/m ²	Progress to be reported starting 2025	Contribute to net zero construction
Water	Decrease (potable) water intensity per visitor by 30% by 2030, compared to 2019 ¹ (previous target – Reduce water consumption by 15% until 2024 compared to 2019)	m ³ per 1,000 visitors	Water intensity per visitor has increased by 3% compared to 2019 baseline and 1% compared to 2023	Develop water-efficient shopping centres
Circular economy	Reach a waste recycling rate of 60% from operations by 2030 ² (previous target – Reach a waste recycling rate of 60% by 2025)	% waste recycled/ total waste produced in operations	46% of waste was recycled in 2024	Operate a zero-end waste business
	Zero avoidable waste to landfill in operations by 2025 ³	% waste to landfill	54% of waste sent to landfill in 2024	Operate a zero-end waste business
Governance	Continue BREEAM In-Use buildings certification, with a minimum of 'Very Good'	Number of certified assets	100% certified portfolio out of which 95% certified 'Very Good' and above (by GLA) ⁴	Be a recognised leader in buildings environmental performance
Biodiversity	Implement a Biodiversity Action Plan for all properties in operation and under development	Action plans in place in each relevant asset	Action plans to be developed and implemented in 2025	Preserve biodiversity and responsibly manage natural resources



5.11 Chapter 5 Key Messages

- There are five main steps for both investors and real estate companies looking to launch a green building program, as outlined below.
 - Raise awareness and identify pipeline;
 - Design sustainability approach;
 - Deploy a technical expert for sustainability assessment;
 - Rely on certification as a proof of compliance;
 - Report impacts.
- Awareness building is an important first step, especially in countries with low sustainability penetration. In order to build awareness, companies are encouraged to hold “discovery workshops” which outline the costs and benefits of sustainable construction. Organizations like IFC, GRESB, Climate Bonds Initiative, and many more have programs that can help create these workshops.
- Financial institutions can work with developer clients in order to create a pipeline. Helping the developers see green analysis on a real, rather than a theoretical project, helps them understand the business case. The analysis can be executed for both new and existing buildings, on single assets or on a portfolio of assets.
- With some understanding of a potential pipeline, companies can then design a sustainability approach. This can be either a formal framework or a pilot transaction. There are many handbooks and guides to help companies create a full framework.
- Catalyzing adoption requires appointing a technical expert to help projects meet sustainability criteria. There are several modes of deployment, including in-house and external consultants, or a hybrid model with an oversight sustainability committee for quality assurance.
- Certification is the best way to reliably communicate value between all stakeholders and to comply with sustainable taxonomies.
- Reporting is executed in line with harmonized guidelines, though companies can disclose additional information through their ESG reporting.

Checklist for the Five Steps to Create a Financing Program:

Step 1: Raise Awareness and Identify Pipeline					
What	Create Sustainability Project Team	Introductory “Discovery Workshop”	Match-make investors and developers	Technical Analysis on a set of real projects	Consider portfolio process
Why	Best practices for organizations looking to launch a sustainable labeled finance program	Introduces in-house and client teams to the benefits of sustainable buildings	Creates additional reach of willing partners toward a robust investment pipeline	Gives comfort to project teams that assets can be greened in a financially sustainable way	Plan how to decarbonize existing portfolio over time for greater impacts
How	Follow steps described in IFC’s Green Bond Handbook. Ensure representation from various teams, for example from both retail and corporate banking sides, in order to cross-sell the sustainable product.	Work with one of the existing programs to design and execute the workshop, and to connect investors and developers, including for example: • EDGE • Building Resilience Index • Climate Bonds Initiative • GRESB • PEEB	Use “upstream” process, with combined advisory and financing package. • See, for example, IFC’s GRIP program for developers and MAGC for banks. Hire consultants, using directories such as: • EDGE Experts • LEED APs • GreenStar APs Train in-house team using platforms like: • EDGE training • BRI training • LEED training • GBCSA Academy	Use Decarbonising Existing Buildings – A Guide to Green Retrofit with EDGE for a step-by-step retrofit planning guide	

Step 2: Design Sustainability Approach

What	Define goals, scope, and sustainability focus	Choose Taxonomies	Partner with developers, mostly for green mortgages	Design incentives	If ready, launch a Sustainability Framework
Why	Balance ability to deploy in known areas vs. capturing early market share in new areas	Compliance with taxonomies can help organizations appeal to new investors	Investors need strong partnerships with developers who will create the sustainable stock	Investors can catalyze developers' adoption, and developers can do the same for tenants, through incentives, awareness, and TA	Appeal to investors and enjoy benefits of sustainable-linked finance incentives
How	Use "upstream" process, with combined advisory and financing package. See, for example, IFC's GRIP program for developers and MAGC for banks. Work with bodies such as PEEB	Use guides such as: ICMA Green Buildings guidelines EU Taxonomy BRI resilience disclosure Blue Finance Guidelines Biodiversity Finance Reference Guide Circular Economy Finance Guidelines	Continue iterative "discovery" process with developers using programs such as: EDGE green buildings Building Resilience Index Climate Bonds Initiative GRESB PEEB	See how investors are already launching both fiscal and non-fiscal incentives from EDGE website for banks Partner with IFC's MAGC program to deploy fiscal incentives through blended concessional funds Use Green Lease Leaders how-to guide	Utilize guides such as: Green Bond Handbook ICMA Guidelines for Sustainable-Linked Financing

Step 3: Deploy a Sustainability Expert

What	Hire an Expert	Train In-House Team
Why	Ensure projects meet eligibility criteria, including for certification, in the same timeline as investment processing	
How	Hire consultants, using directories such as: EDGE Experts LEED APs GreenStar APs	Train in-house team using platforms like: EDGE training BRI training LEED training GBCSA Academy

Step 4: Rely on Certification as Proof of Compliance

What	Green Building Certification	Building Resilience Verification	Other Taxonomies
Why	Compliance with accepted certification programs ensures access to green finance and communicates value between investors, developers, and end users	Communicate value and improve financial standing with insurers	Certifications for individual assets do not yet exist, but third party verifiers can confirm compliance of company's framework with the standard
How	Utilize international and recognized national or regional certification systems such as the ones from the below (non-exhaustive) list: • EDGE • Green Star (in Africa via GBCSA) • IGBC • China Green Building Evaluation Standard • LEED • BREEAM • Estidama Pearl Rating System • DGNB • HQE	• Utilize Building Resilience Index for disclosure and verification	• Use third-party verifiers such as the ones from the ICMA External Reviewers List

Step 5: Report on Impacts

What	Generate impact data for each asset financed	Report across the portfolio	Report to voluntary peer benchmarking platforms	Comply with regulations
Why	Comply with sustainability finance guidelines which require asset-level reporting	Comply with sustainability finance guidelines and also benchmark assets against each other	Attract investors and benchmark performance against peers	Ensure alignment with local regulation and with leading global frameworks
How	Utilize tools like energy modeling software, Building Information Modeling (BIM) software, and online calculators to generate impacts data. EDGE App is a one-stop-shop cloud software with an impact calculator, building modeling, and financial estimates.	Use EDGE App to generate portfolio-wide data. Use IFC's CAFI Tool to report across investment portfolio (beyond real estate). Use ESG software such as from the below, non-exhaustive list: • Workiva • IBM Envizi ESG Suite • Novata • Persefoni • Coolset	Utilize platforms such as: • CDP • GRESB	Find local regulations, including guidance through local sustainable taxonomies. If working with EU investors and companies, comply with EU regulations. Follow TCFD best practices.



AgaHall East – Housing in India

6

Conclusion

This Guide attempted to catalogue the investment opportunity for sustainable construction and deploy a step-by-step guide for financial institutions working in sustainable construction. While the Guide was focused on investors, the lessons learned and case studies should also be applicable to real estate developers, owners, and managers. Sustainable buildings represent a tremendous investment opportunity because real estate is the world's largest asset class. The business opportunity is complemented by the need for climate action, as both climate mitigation and adaptation are needed to climate proof the assets where humans spend most of their time – after all, buildings provide a space for humans to live, work, study, enjoy leisure, and much more.

Technical recommendation without finance at scale are not enough to catalyze markets. Conversely, finance without proper technical assistance is not enough to move the construction industry from a brown to a green path. However, a combination of awareness building, thoughtful technical assistance, and finance can indeed serve as that

catalyst. IFC's experience with our own investment program and the sea change we mobilized in countries like Colombia show that meaningful change is possible, with benefits shared by investors, developers, and building users.

The Case Studies presented showcased the journey of varied institutions from across the world – from a large, diversified commercial bank to a financier of self-built housing, from financial institutions to real estate developers and property owners, from the public to the private sector, from East Asia to Latin America. Their journey through the five steps of creating a sustainable real estate investment program is summarized in the table below, offering a snapshot of how different actors have tackled the challenges of sustainable finance scale up. The numerous other case studies represented in the Guide aimed to illustrate unequivocally that sustainable construction is good for the triple bottom line – with benefits to people, planet, and profits. We hope you will join us on the journey toward more sustainable construction.

Case Study	Step 1: Raise awareness and identify pipeline	Step 2: Design sustainability approach	Step 3: Deploy a technical expert for sustainability assessment	Step 4: Rely on certification as a proof of compliance	Step 5: Report impacts
NEPI Rockcastle – Developer and Property Owner in Europe	Operates in countries with a more mature but still nascent understanding of sustainability, due to EU regulations. Works closely with tenants and business partners to raise awareness, promote eco practices, and drive collective support for environmental sustainability in all regions it operates	Use-of-proceeds Green Financing Framework was expanded into the 2023 company-wide target-driven Sustainability-Linked Financing Framework. Expanding from energy efficiency into provider of renewable energy. Investments in both new construction and retrofit improvements.	Dedicated Sustainability Department that oversees independent authorized consultants employed to review and certify (or re-certify) their buildings.	Relies on the EU Taxonomy definitions or projects that are certified with BREEAM, LEED, EDGE, or HQE certification mechanisms	In Sustainability-Linked Financing Framework, focuses on Scope 1 and 2 GHG emissions and energy intensity of common areas. In the Sustainability Report, discloses more information across energy, water, biodiversity, and circular economy.
Asia Green Real Estate – Fund investing in real estate across East Asia	Uses low penetration of sustainable construction in countries of operation as an advantage to developers and investors. Multi-pronged approach that includes tenant engagement, proprietary green building tools, and strategic partnerships, including with disclosure platforms like GRESB	Focus on commercial and residential new construction. Uses GRESB disclosure as a crucial tool for investors.	Provides in-house technical assistance including through the proprietary Eco-Tool which helps them identify opportunities for improvement.	Uses its proprietary EcoTool for analysis but certifies its building with EDGE, LEED, WELL, Greenship, DGNB, or China's Green Building Label	Reports impacts in part as a comparison of its portfolio to the peer group, utilizing available GRESB data.

Case Study	Step 1: Raise awareness and identify pipeline	Step 2: Design sustainability approach	Step 3: Deploy a technical expert for sustainability assessment	Step 4: Rely on certification as a proof of compliance	Step 5: Report impacts
Aavas – Financier for self-built homes in South Asia	Uses virtual absence of sustainable self-built homes market in India as a point of differentiation and appeal to both homeowners and investors. Utilizes both institutional and community-based outreach, using brochures, manuals, social media, blog articles, press releases, and audio-visual films to promote green homes	Focuses on greening self-built housing, supported by concessional finance provided through IFC's MAGC Program.	In-house team provides technical expertise and guidance to help homeowners make informed decisions about sustainable building practices.	Utilizes EDGE certification for self-built homes.	Sustainability Report discloses the financier's actions to green its own operations and focuses the impact reporting on the first pilot transactions for self-built homes, with GHG, energy, and water savings as well as the cost savings for the home buyer.
FIBRA Macquarie – REIT investing and owning industrial properties in Latin America	Operates in Mexico, with nascent but quickly growing sustainable market. Green Lease collaboration between landlord and tenants, with technical support and data collection that drives further improvement strategies	Bases work on Sustainability Linked Financing Framework. Investments in both new construction and retrofit improvements. Diversified offer from energy efficiency measures into renewable energy. Provides green lease for tenants.	Utilizes external consultants for technical analysis and the certification process, but oversees their work through the Sustainability Committee. Relationship with IFC's GRIP program for a company-wide sustainability strategy.	Works with EDGE, LEED, and BOMA certifications.	Sustainable-Linked Financing Framework focuses only on proportion of green certified properties. ESG Report discloses data coverage, green building and green lease certifications, reducing resource consumption, rooftop solar efforts, water scarcity, solid waste management, and impact on biodiversity.
Absa Group – commercial bank in Africa	Partnership with developers to build awareness and certifying its own buildings to demonstrate commitment	Finances a wide range including commercial, residential, industrial, and mixed-use properties. Cross-sells between developer finance and mortgages. Provides Eco Home Loans as a differentiated product. Strategy based on the Sustainable Finance Issuance Framework.	Oversight by the Social, Sustainability, and Ethics Committee (SSEC). Collaborates with external consultants for technical assistance, including through IFC's MAGC Program.	Recognizes regional, national, or internationally recognized standards or certifications and explicitly names Green Star, LEED, and EDGE.	Sustainability disclosure is the most complex of the case studies, with information on strategy and governance, climate scenario testing, as well as financial allocation and impacts across the portfolio.
Colombia – market catalyzation through public and private sector collaboration in Latin America	Multi-faceted approach through green building codes, tax incentives, partnerships with international organizations, and certification program administered by the chamber of construction.	Wider-reaching green building code but focused tax benefits for project design services and technical solutions. Green Taxonomy enabled financial markets to scale sustainable products very quickly.	Evolution of technical expertise, starting with advisory engagement with IFC through a creation of a cadre of sustainability experts. Training of university students through the "Design for Greater Efficiency" program.	Green Taxonomy specifies certain technical achievements for eligibility but uses equivalence with international certifications (such as LEED and EDGE) and national programs (such as CASA Colombia).	Discloses information through documents such as Nationally Determined Contribution (NDCs) and National Roadmap for Net Zero Carbon Buildings. IFC assesses country market maturity through own research.

Index of companies, organizations, and governments referenced in the Sustainable Buildings Finance Guide

Organization	Country / Region	Sector	Contribution to sustainable Buildings	Chapter appearance
Aavas Financiers	India	Finance for affordable housing	Pioneer for green self-built housing certification process	Throughout the Guide
Absa Bank	Africa	Green finance for construction and finance	Pioneering incentivized construction loans and green mortgages	1
Acorn Holdings	Kenya	Developer / Green Bonds	Issued first Kenyan green bond	5
Arthaland (ACPT & Cebu Exchange)	Philippines	Office Development	Energy savings and higher rental prices through certification	4
Asia Green Real Estate	Asia	Green finance for commercial and residential developments	Committed to certifying every building with appropriate standard	Throughout the Guide
Atlantic Tower	Ghana	Office	Attracts multi-national clients through green certification	4
Ayala Land	Philippines	Commercial Real Estate	Largest EDGE Zero Carbon portfolio	2
BBVA Peru	Peru	Banking / Residential Finance	Green mortgage lending; supported by public policy	1
Balwin Properties	South Africa	Residential Developer	Largest EDGE certification registration globally	1, 3, 5
Bancolombia	Global	Impact Reporting Tool	Tracks portfolio-level green building metrics	5
	Colombia	Green finance	Green bonds for construction and mortgages	4
Banco Pichincha	Ecuador	Green finance	Provides free technical assistance for green certification	5
Banco Pichincha	Ecuador	Bank / Technical Assistance	Supported housing retrofits	
Bangkok Dusit Medical Services	Thailand	Healthcare	Water & energy efficiency; improved returns	4
CEMEX	Mexico	Building Materials	Circular economy practices; waste recycling	2
	Global	Certification	Widely-used green building certification platform	4
CIB Bank	Egypt	Bank / Commercial Real Estate	Green bond to support green building market	1, 5
Colombia	Latin America	Public policy	Sector-wide impacts - Champion for green incentives and green finance taxonomy	Throughout the guide
Davivienda	Colombia	Banking / Residential & Office	Discounted loans for certified developments	3, 4
District Municipality of San Borja, Lima	South Africa	Bank / Gender & Green bancoFinance	Green affordable housing loan with gender carve-out	1, 2, 3
	Peru	Government	Non-fiscal public incentives for green construction	1

Organization	Country / Region	Sector	Contribution to sustainable Buildings	Chapter appearance
EBRD	Europe, MENA, Central Asia	Development Bank / Green Facility	Supported green buildings through GEFs and GET programs	1
EDGE	Global	Certification	Widely-used green building certification platform	4
Fannie Mae	USA	Mortgage Lender	Green mortgage-backed securities; lower defaults	1, 2
FIBRA Macquarie	Mexico	Industrial REIT	Pioneer in green construction, finance, and green leases	Throughout the Guide
FirstRand	South Africa	Bank / Gender & Green bancoFinance	Green affordable housing loan with gender carve-out	1, 2, 3
Global Alliance for Buildings and Construction	Netherlands	Digital Platform / Circular Economy	Enabled material reuse via passports	2
	Global	Alliance	Sector-wide awareness, advocacy, and training	1
Grupo Bancolombia	Colombia	Banking / Real Estate	Green building financing programs and awareness campaigns	3, 4
HC Capital Properties	Côte d'Ivoire	Commercial developer	Lower interest rate through green bond refinance	3
Indira Paryavaran Bhawan	India	Government / Office	Net-zero government facility	4
International Housing Solutions	South Africa	Residential Rental	Utility savings passed to tenants	3, 4
King Hussein Business Park	Jordan	Office (Retrofit)	Large operational savings post-retrofit, Payback period less than 20 months for retrofits	4
LatAm Logistics	Peru	Industrial	Quantifies value proposition through certification	4
MAGC (Market Accelerator)	Global	Blended Finance Program	Accelerates green construction via concessional finance	3, 5
Madaster	Netherlands	Digital Platform / Circular Economy	Enabled material reuse via passports	2
McDonald's	USA	Retail / QSR	Net-zero energy flagship restaurant	2
Mother and Baby Hospital	Ghana	Healthcare	Utility savings used for medicine and more staff	4
Nedbank	South Africa	Green finance	Green bonds for construction and mortgages	3
NEPI Rockcastle	Europe	Owner and operator of commercial real estate	Pioneer in green and sustainable-linked finance	Throughout the Guide
NEO	Philippines	Commercial Office	Green premium rents; low vacancy	3, 4
One Bangkok	Thailand	Smart District / Mixed-use	LEED ND Platinum; added value from sustainability	4
PEEB (Programme for Energy Efficiency in Buildings)	Global	Advisory / Financing	Sector-wide awareness, advocacy, and training	1

Organization	Country / Region	Sector	Contribution to sustainable Buildings	Chapter appearance
ProCredit Bank	Europe	Banking / Office HQs	Certified net-zero buildings; enabled green bond eligibility	2
Regent Garment Factory	Vietnam	Industrial	Energy savings supporting export compliance	4
Schwarz Group (Lidl & Kaufland)	Europe	Retail	Store efficiency upgrades; cost and energy savings	4
Signature Global / Capital House	India / Vietnam	Residential	Green home development; faster sales	4
Tu Berlin Adlershof	Germany	Education / Office	Green facades; cooling cost reduction	2
ULI (Urban Land Institute)	Global	Policy & Resilience Advocacy	Developed Resilience Toolkit for property developers	2
UNEP & GlobalABC	Global	Policy / Data	Market analysis, technical and regulatory frameworks	1, 2, 5
Vinte	Mexico	Residential construction	Developer of green and resilient communities, financed by sustainable bonds	2, 3
YTL Power	Malaysia	Data Center	High savings via efficiency retrofits	4

References

Absa Group (2023).
Sustainable Finance Issuance Framework.

Absa Group (2024).
Sustainability and Climate Report.

Ahmadisharaf, Ebrahim, Nasrin Alamdari, Masoud Tajrishy, and Sahar Ghanbari. "Effectiveness of retention ponds for sustainable urban flood mitigation across range of storm depths in northern Tehran, Iran." *Journal of Sustainable Water in the Built Environment* 7, no. 2 (2021): 05021003.

Aladesote, Olatunde John. "Cost-benefit analysis of green infrastructure for sustainable stormwater management of the built environment." *Int. J. Res. Publ* 97 (2022): 314-326.

Andrade, Cecilia Lozada (2021). Colombia: Green Buildings Accelerate from Zero to 20% of the Market in Four Years. Accessible from: <https://edgebuildings.com/the-transformation-of-colombias-green-building-market-from-zero-to-20-percent>

American Society of Landscape Architects.
"Bioswales," accessed April 17, 2025, <https://www.asla.org/bioswales.aspx>.

Arthaland. (n.d.). Cebu Exchange. Retrieved from <https://arthaland.com/project/cebu-exchange/>

Arup. (n.d.). Circular Buildings Toolkit – Strategies. Retrieved from <https://ce-toolkit.dhub.arup.com/strategies>

Asia Green Real Estate (2023).
Sustainability Report 2023.

ANREV and GRESB. (2024). The Influence of ESG on Asia Pacific Real Estate Fund Performance. <https://www.anrev.org/en/research/topical-research/>

ASTM International. (2024). Standard Guide for Property Resilience Assessments E3429-24. Retrieved from ASTM International website

Ayalew, Tibebu B., Witold F. Krajewski, and Ricardo Mantilla. "Insights into expected changes in regulated flood frequencies due to the spatial configuration of flood retention ponds." *Journal of Hydrologic Engineering* 20, no. 10 (2015): 04015010.

Berlin Senate for Urban Development (2010) Rainwater management concepts: greening buildings, cooling buildings. http://www.gebaeudekuehlung.de/SenStadt_Rainwater_en_large.pdf

Cairncross, Lenore and Naicker, Elosan (2020).
Green innovation for long-term affordability

CBRE Thailand. (2023) Thailand Real Estate Market Outlook 2023. Retrieved from <https://www.cbre.co.th/insights/reports/2023-thailand-real-estate-market-outlook>

CDP (2023)
2023 Climate Change Scoring Methodology

Cemex & Ellen MacArthur Foundation. (2024). Cemex partners with the Ellen MacArthur Foundation to accelerate circular economy efforts in the built environment. Retrieved from <https://www.cemex.com/w/cemex-partners-with-the-ellen-macarthur-foundation-to-accelerate-circular-economy-efforts-in-the-built-environment>

Cemex & Heim Group. (2024). Cemex expands Regenera circularity business with acquisition in Berlin. Retrieved from <https://www.businesswire.com/news/home/20240903523182/en/Cemex-expands-Regenera-circularity-business-with-acquisition-in-Berlin>

Climate Bonds Initiative (2023).
Buildings Criteria 2.1

Climate Bonds Initiative (2024). The Role of Development Finance Institutions in Accelerating the Mobilisation of Green Capital.

Climate Champions. (n.d.). Race to Zero campaign. Retrieved from <https://www.climatechampions.net/campaigns/race-to-zero/>

Colliers Colombia. (2023). Bogotá Office Market Report Q3 2023. Retrieved from <https://www.colliers.com/en-co/research/bogota-office-market-report-q3-2023>

Colliers Philippines. (2023). Philippines Office Q3 2023 Property Market Report. Retrieved from <https://www.colliers.com/en-ph/research/colliers-quarterly-property-market-report-office-q3-2023-philippines>

Deng, Chuxiong, Guangye Zhang, Yaojun Liu, Xiaodong Nie, Zhongwu Li, Junyu Liu, and Damei Zhu. "Advantages and disadvantages of terracing: A comprehensive review." *International soil and water conservation research* 9, no. 3 (2021): 344-359.

Devine, Avis, Sanderford, Andrew, and Chongyu Wang. "Sustainability and Private Equity Returns." *The Journal of Real Estate Finance and Economics* (2024) 68:161–187. <https://doi.org/10.1007/s11146-022-09914-z>

Electricity Generating Authority of Thailand (EGAT). (n.d.) Retrieved from <https://www.egat.co.th/home/en/>

Energy Efficiency Data Protocol and Portal (2020). Final report on correlation analysis between energy efficiency and risk.

Enzi, V. (2025) Green infrastructure and nature based solutions in Building: Benefits and co-benefits of green roofs and walls to the urban climate and energy efficiency. https://globalabc.org/sites/default/files/2025-02/EFB_ENZI_UNEP_GLOBALABC_o6_o2_2025.pdf

European Commission. (n.d.). European Climate Law. Retrieved from https://climate.ec.europa.eu/eu-action/european-climate-law_en

European Commission (2021).
EU Taxonomy for Sustainable Activities

Ewane, Ewane Basil et al. "Influence of urban forests on residential property values: A systematic review of remote sensing-based studies." *Heliyon* vol. 9,10 e20408. 24 Sep. 2023, doi:10.1016/j.heliyon.2023.e20408

Fannie Mae. (n.d.). Healthy Housing Rewards program. Retrieved from <https://multifamily.fanniemae.com/financing-options/specialty-financing/healthy-housing-rewards>

Fannie Mae. (2024). Impact from Fannie Mae Green and Social Bonds. Retrieved from <https://www.fanniemae.com/media/43956/display>

The Financial District (2024).
Ayala Land's AREIT Achieves EDGE Zero Carbon Certification For 8 Office Buildings

FIBRA Macquarie (2023).
Sustainability-Linked Financing Framework.
FIBRA Macquarie (2023a).

2023 ESG Report.
GlobalData. (n.d.). Sustainability in Healthcare – Thematic Research. Retrieved from <https://www.globaldata.com/store/report/sustainability-in-healthcare-thematic-research/>

Global Alliance for Buildings and Construction (2025).
A Methodology for tracking Decarbonisation Action and
Impact of the Buildings and Construction Sector Globally.

[Global Alliance for Buildings and Construction \(GlobalABC\),
United Nations Environment Programme \(UNEP\), & Interna-
tional Energy Agency \(IEA\). Global Status Report for Build-
ings and Construction 2024/2025. UNEP, 2025.](#)

Government of Colombia (2022).
Taxonomia Verde de Colombia.

GRESB (2022).
Real Estate Reference Guide

INREV and GRESB.(2023). ESG Insights in Non-Listed Fund
Performance. [https://www.inrev.org/news/inrev-news/
new-paper-impact-esg-european-non-listed-fund-perfor-
mance](https://www.inrev.org/news/inrev-news/new-paper-impact-esg-european-non-listed-fund-performance)

International Capital Markets Association (2021).
Green Bond Principles: Voluntary Process Guidelines for
Issuing Green Bonds.

International Capital Markets Association (2023).
Sustainability-Linked Bond Principles.

International Finance Corporation EDGE. (n.d.). King Hussein
Business Park – Building Four. Retrieved from [https://edge-
buildings.com/project-studies/king-hussein-business-park-
building-four/](https://edgebuildings.com/project-studies/king-hussein-business-park-building-four/)

a. IFC EDGE & Sintali. (n.d.). Asset Owners Take Note: First
EDGE Zero Carbon Whole Building Portfolio is Certified in
the Philippines. Retrieved from [https://edgebuildings.com/
asset-owners-take-note-first-edge-zero-carbon-whole-
building-portfolio-is-certified-in-the-philippines/](https://edgebuildings.com/asset-owners-take-note-first-edge-zero-carbon-whole-building-portfolio-is-certified-in-the-philippines/)

b. IFC EDGE & Sintali. (n.d.). Regent Garment Factory –
Phase 2B. Retrieved from [https://edgebuildings.com/proj-
ect-studies/regent-garment-factory-2b/](https://edgebuildings.com/project-studies/regent-garment-factory-2b/)

International Finance Corporation (2019).
Green Buildings: A Finance and Policy Blueprint for Emerging
Markets

International Finance Corporation (2020).
Green Bond Handbook: A Step-by-Step Guide to Issuing a
Green Bond

International Finance Corporation (2022).
Blue Finance: Guidance for financing the Blue Economy
International Finance Corporation (2022a).
Biodiversity Finance Reference Guide.

International Finance Corporation (2022b).
Sustainability-Linked Finance – Mobilizing Capital for Sus-
tainability in Emerging Markets.

International Finance Corporation (2023).
Building Green: Sustainable Construction in Emerging Mar-
kets

International Finance Corporation (2023a).
Catalogue of Nature-Based Solutions for Infrastructure
Projects.

International Finance Corporation (2023b).
MAGC Green Building Market Maturity Assessment, pub-
lished at [https://edgebuildings.com/resources/market-accel-
erator-for-green-construction/](https://edgebuildings.com/resources/market-accelerator-for-green-construction/)

International Finance Corporation (2024).
Cooler Finance: Mobilizing Investment for the Developing
World's Sustainable Cooling Needs.
International Finance Corporation (2024a).
Nature-Based Solutions in Cities.

International Finance Corporation (2025).
Harmonized Circular Economy Finance Guidelines.

International Finance Corporation and Amundi (2023).
Emerging Market Green Bonds.

International Capital Markets Association: the Green Bond Principles Impact Reporting Working Group (2019). Suggested Impact Reporting Metrics for Green Building Projects

Global Alliance for Buildings and Construction (2022). Global Status Report for Buildings and Construction

Global Facility for Disaster Reduction and Recovery (GFDRR). (2021). Scaling Up and Mainstreaming Resilience in a World of Compound Risks: GFDRR Strategy 2021–2025. Retrieved from <https://documents1.worldbank.org/curated/en/955811620194170587/pdf/GFDRR-Strategy-2021-2025-Scaling-Up-and-Mainstreaming-Resilience-in-a-World-of-Compound-Risks.pdf>

JLL. (n.d.). Colombia Locations. Retrieved from <https://www.jll.com/en-us/locations/colombia>

Kasprzyk, Magda, Wojciech Szpakowski, Eliza Poznańska, Floris C. Boogaard, Katarzyna Bobkowska, and Magdalena Gajewska. "Technical solutions and benefits of introducing rain gardens—Gdańsk case study." *Science of the Total Environment* 835 (2022): 155487.

Knight Frank. (2023). Malaysia Data Centre Research Report – 2023. Retrieved from <https://www.knightfrank.com.my/research/malaysia-data-centre-research-report-2023-11336.aspx>

Loan Market Association (2025). Sustainability-Linked Loan Principles.

Malaysian Green Technology and Climate Change Corporation (MGTC). (n.d.). Green Technology Financing Scheme (GTFS). Retrieved from <https://www.mgtc.gov.my/what-we-do/green-finance/green-technology-financing-scheme-gtfs/>

Meralco. (2023). June 2023 Rates Update. Retrieved from Meralco's official news and advisories archive

Musić, Rusmir (2021). Building the business case for green affordable housing.

Musić, Rusmir (2023). Can Africa afford green and resilient housing?

Menes, Rebecca (2019). Green Building through Green Bonds in Colombia

Nature Networks (n.d.) Adlershof Berlin – Combination of Decentralised Rainwater Management, Building Greening & Elements for Cooling and Ventilation. <https://networknature.eu/casestudy/19560>.

NEPI Rockcastle (2023). Climate Change Risks and Opportunities Report.

NEPI Rockcastle (2023a). Green Financing Framework.

NEPI Rockcastle (2023b). Sustainability-Linked Financing Framework.

NEPI Rockcastle (2024). Annual Report 2024.

Net Zero Climate. (n.d.). Net Zero Regulation Stocktake. Retrieved from <https://netzeroclimate.org/regulation-tracking/>

Perini, Katia, and Paolo Rosasco. "Cost–benefit analysis for green façades and living wall systems." *Building and Environment* 70 (2013): 110–121.

Property Forum. (2024). NEPI to power Romanian portfolio from green sources by 2026. Accessed from: <https://www.property-forum.eu/news/nepi-to-power-romanian-portfolio-from-green-sources-by-2026/19342>

Rosso, Federica, Francesco Cappa, Rebecca Spitzmiller, and Marco Ferrero. "Pocket parks towards more sustainable cities. Architectural, environmental, managerial and legal considerations towards an integrated framework: A case study in the Mediterranean region." *Environmental Challenges* 7 (2022): 100402.

Science Based Targets Initiative. (n.d.). Home. Retrieved from <https://sciencebasedtargets.org/>
Sintali. (n.d.). Case Study: Lidl Latvia. Retrieved from <https://www.sintali.com/case-study-lidl-latvia>
Sintali (2021).

Decarbonising Existing Buildings: A Guide to Green Retrofit with EDGE
Skidmore, Owings & Merrill. (n.d.). ArthaLand Century Pacific Tower. Retrieved from <https://www.som.com/projects/arthaland-century-pacific-tower/>

Superintendencia de Servicios Públicos Domiciliarios (SSPD). (2024). Boletín tarifario de energía – Tercer trimestre de 2024. Retrieved from <https://www.superservicios.gov.co/sites/default/files/inline-files/Boletin-tarifario-de-energia-tercer-trimestre-de-2024.pdf>

Tenaga Nasional Berhad. (n.d.). Residential Pricing & Tariffs. Retrieved from <https://www.tnb.com.my/residential/pricing-tariffs>

Tostevin, Paul and Rushton, Charlotte (2023).
Total Value of Global Real Estate: Property remains the world's biggest store of wealth

UNEP. (2023). Adaptation Gap Report 2023: Underfinanced. Underprepared. Retrieved from <https://www.unep.org/resources/adaptation-gap-report-2023>

UNEP & GlobalABC. (n.d.). Global Alliance for Buildings and Construction. Retrieved from <https://www.unep.org/topics/cities/buildings-and-construction/global-alliance-buildings-and-construction-globalabc>

University of North Carolina Center for Community Capital (2013). Home Energy Efficiency and Mortgage Risks.

ULI (2023). Developing Resilience Toolkit.

UNEP (2023). Building Materials and the Climate: Constructing a New Future.

U.S. Environmental Protection Agency. "Rain Gardens." December 2010, https://www.epa.gov/system/files/documents/2021-10/raingardens_dec10_2slides.pdf

U.S. Environmental Protection Agency, "Permeable Pavements," November 2021, <https://www.epa.gov/system/files/documents/2021-11/bmp-permeable-pavements.pdf>

U.S. Green Building Council. (n.d.). LEED rating system. Retrieved from <https://www.usgbc.org/leed>
UNFCCC. (n.d.). HS Vision & Summary 2.1. Retrieved from https://unfccc.int/sites/default/files/resource/HS_Vision%26Summary_2.1_o.pdf unfccc.int+2

World Bank (2020).
Primer for Cool Cities: Reducing Excessive Urban Heat with a Focus on Passive Measures.

World Bank (2024a).
Rising to the Challenge: Success Stories and Strategies for Achieving Climate Adaptation and Resilience

World Bank. (2024b). Resilience Rating System (RRS). Retrieved from <https://www.worldbank.org/en/topic/climateexchange/brief/resilience-rating-system-rrs>

World Economic Forum. (2024). Circularity in the Built Environment: Unlocking Opportunities. Retrieved from https://reports.weforum.org/docs/WEF_Circularity_in_the_Built_Environment_2024.pdf

World Sustainable Hospitality Alliance (2020).
Business Case for Sustainable Hotels.

