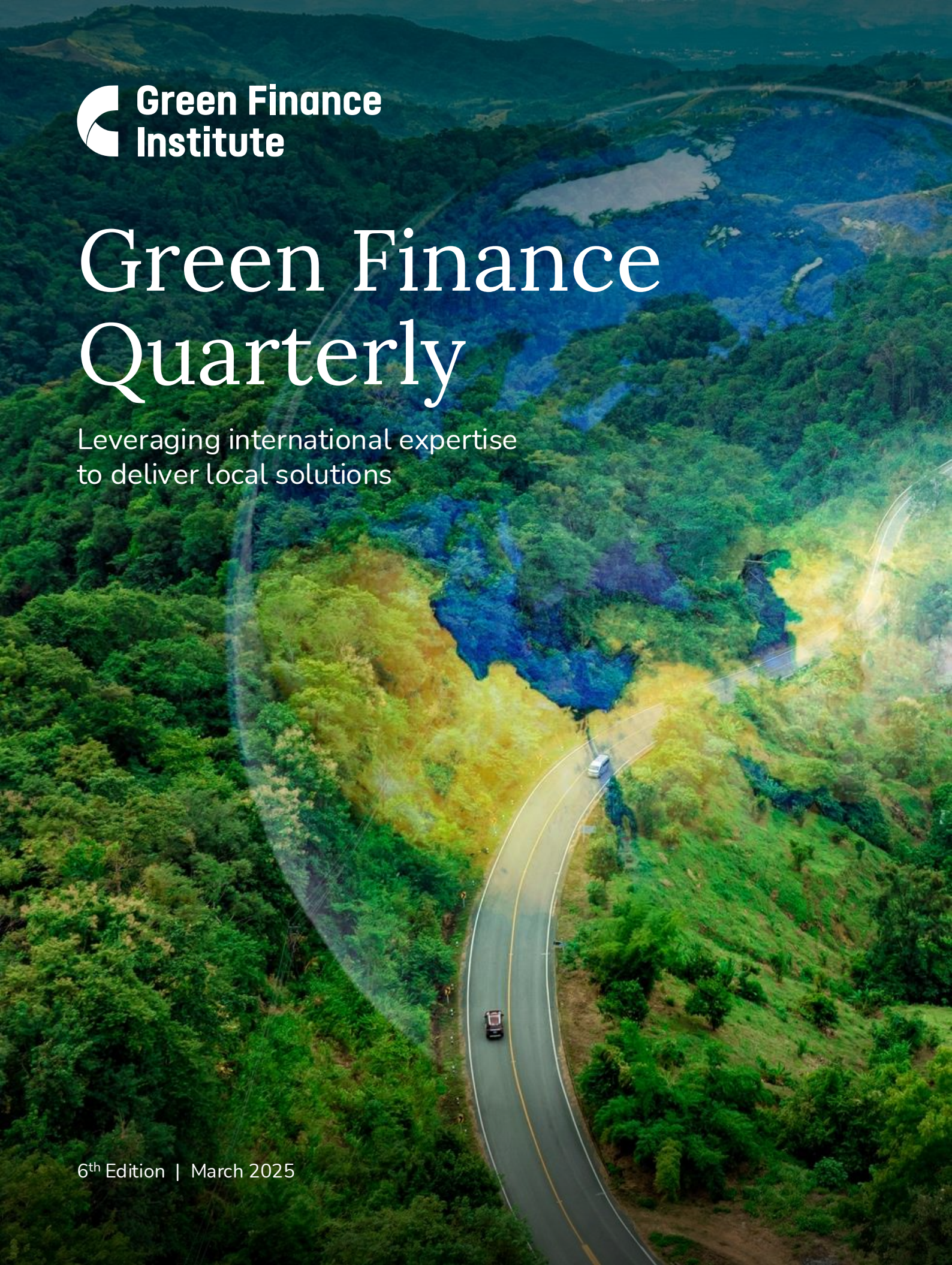
Green Finance Institute

Green Finance Quarterly

Leveraging international expertise to deliver local solutions



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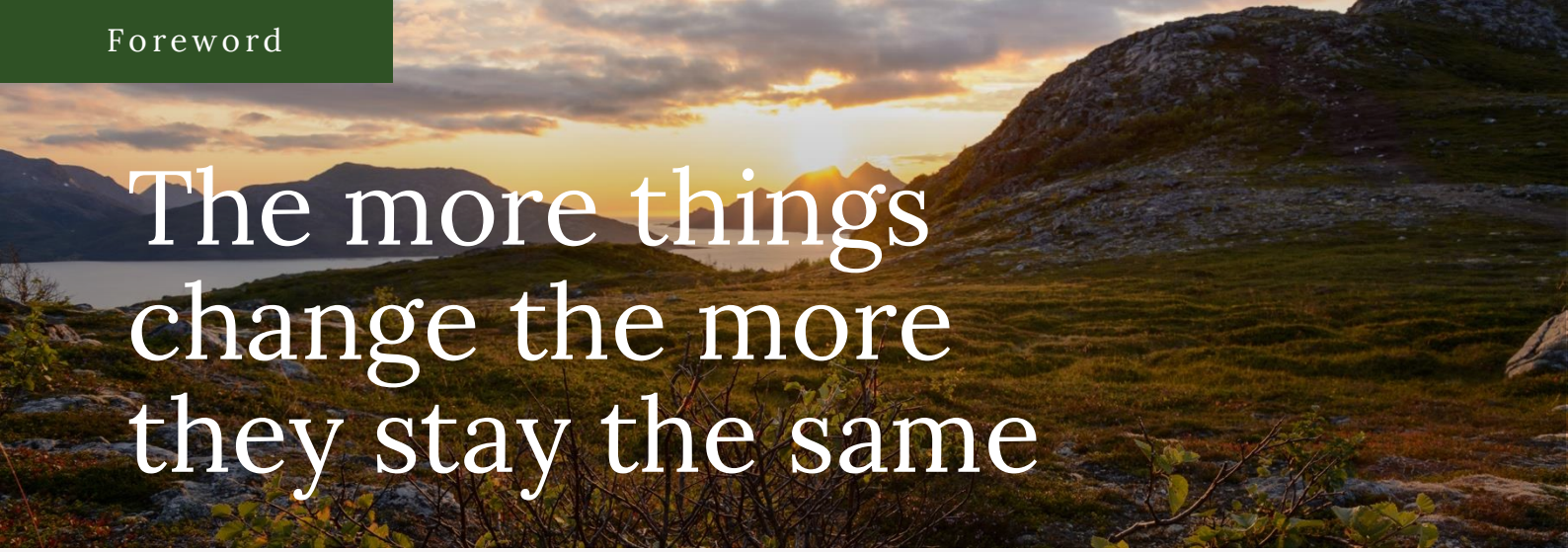


The more things change the more they stay the same

Dr. Rhian-Mari Thomas

CEO of the Green Finance Institute

It should come as no surprise that as governments move from climate commitments to policy implementation, the reality of the changes required during a cost-of-living crisis are going to unearth genuine trade-offs and present challenges. Similarly, as lenders and investors face up to the transition, having made net zero commitments, they are increasingly confronting the difficulties of what that transition really entails. All of this is fuelling a media narrative in which we are witnessing a paradigm shift away from net zero.

But there are two fundamentals that have not changed. The first is the science. January was the hottest on record, surprising scientists who expected the cooling effect of the La Nina weather cycle to slow almost two years of record-breaking temperatures.

Since then, two scientific papers claim that the world has now entered a period where global temperatures are in breach of the 1.5 degrees of warming above pre-industrial levels which was the limit set in the Paris agreement in 2015. When that agreement was signed, the world was projected to reach that 1.5C threshold by 2045. We are now living in a world that has a different climate to that of our parents and grandparents.

The second is that capital will flow to where it can make adequate risk-adjusted returns. This includes both fossil fuels assets and net zero infrastructure and technology. Unless and until shared commitments from investors and lenders lead to more net zero opportunities that deliver these returns, capital will not flow.

So whilst the political consensus around net zero characterised by high profile climate commitments from both governments and alliances of investors is ending, what hasn't changed are scientific and commercial imperatives. The question now is how we can align them.

> We need to recalibrate our approach to address our changing climate – not a retreat but a greater emphasis toward pragmatic action based on an honest assessment of what is leading to the mobilisation of capital at scale to project-level infrastructure and technology.

However, barriers to investing are real and need to be overcome. As expressed in Clayton Christensen's Innovators Dilemma, incumbent businesses are focused on their existing customer base, which can make the calculations for investing in new, unproven technologies appear less profitable or too risky.

New technologies and business models by definition have limited performance data – you cannot simply extrapolate historical trends to demonstrate a business case. The financial sector, which takes a linear approach to risk, will not always take the leap alone.

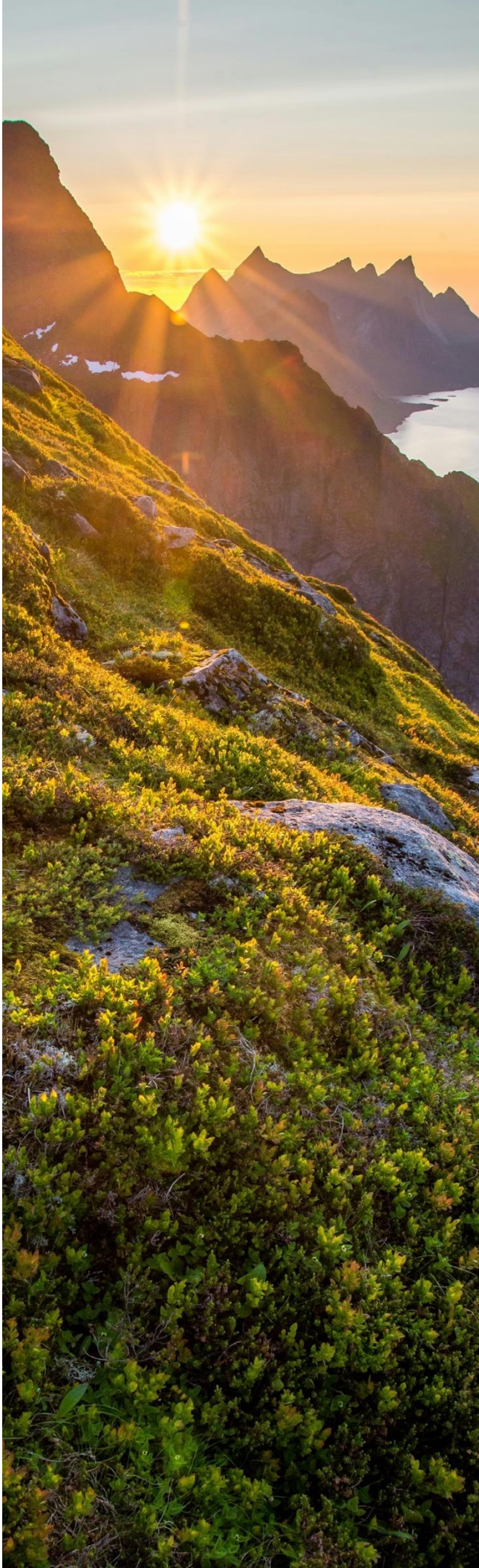
The organisations that should be able to take the greatest risk are those which write the rules that enable new technologies to succeed – and that is governments. It is irrational for a government to invest its funds in a new industry segment only to then pass policies that would make it unprofitable or subsequently un-investable. So, even as the political consensus on net zero has frayed, there is still an opportunity to attract international investment to drive growth.

The government balance sheet should be willing to take a different view on risk and return to catalyse the system, create new industries, new jobs and greater prosperity.

Supporting both governments and investors to develop these investment opportunities remains the core mission of the GFI. We have designed several innovative finance solutions and specific policy frameworks to de-risk investment, from Sustainable Aviation Fuel to Revenues for Nature – a global program that is identifying the models for nature-based investing that are working and finding ways to replicate and scale them. We are determined to bring together public capital providers like the National Wealth Fund, with private investors, to run pilots and scale these solutions.

In our sixth edition of the Green Finance Quarterly, we're focused on leveraging international expertise to deliver local solutions. Blueprints for financing the decarbonisation of our built environment can be found globally, but replicating locally is a matter of amending policies that drive demand, result in economies of scale, reduce risk and cost of capital such that we mobilise institutional investment. Nordic cleantech is a force waiting to be unleashed into the market to enable decarbonisation - we're looking at how to unlock financing to catalyse the region's cleantech innovations. In the UK, Community Municipal Investment is gaining momentum as a means to drive private investment into local communities; scaling this blueprint internationally is a promising option for municipal borrowing to drive place-based infrastructure.

There are brilliant minds globally who are mobilising capital to flow into projects to support resilient economies and local communities. Despite the noise, the physics underpinning climate change won't bend to political cycles, and science must inform investment which in turn needs to inform policy. Smart money is moving in the right direction, now let's scale it.



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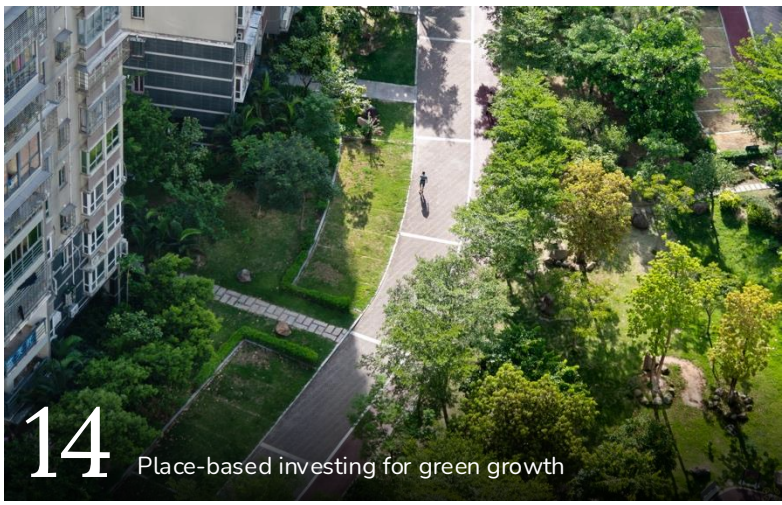

Local solutions for global challenges: Financing a greener built environment

The global built environment faces significant pressure to increase resilience against climate change and reduce carbon emissions: buildings account for 26% of global CO2 emissions.[1] However, less than 1% of buildings are renovated annually, often achieving limited energy efficiency improvements.[2] The challenge is clear: how do we mobilise more capital into decarbonising our built environment at pace and scale?

Less than 1% of buildings are renovated annually.

As we've covered in previous editions of GFQ, scaling retrofitting efforts to decarbonise our built environment faces significant financial barriers. The current financial landscape struggles to address the major barriers to energy efficiency and resilience improvements. These challenges include the high upfront costs of energy efficiency improvements, long payback periods of low carbon technologies, and the split incentive between owners and tenants in the private rented sector. The lack of aggregated portfolios complicates financing, while dependence on personal savings to cover the upfront costs often excludes low-income households with limited financial buffers. Furthermore, fragmented policies, limited public resources, and heavy reliance on subsidies all hinder retrofitting progress.

From product innovation to scaled markets

Scalable solutions at the local level are crucial for addressing these challenges and accelerating the decarbonisation of buildings. While new financial models are emerging to bridge the gap and create new asset classes, their impact will depend on successfully scaling them into investable markets.

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Key solutions include expanding the green mortgage market, growing the unsecured green home loans market, increasing access to finance through demand aggregation, reducing financial risk and improving efficiency through heat-(or energy-)as-a-service, and linking financing to the property (instead of the owner) through property-linked finance.[3]

1 IEA - Energy System, Buildings
2 International Energy Agency - World Energy Outlook (2024)
3 Green Finance Quarterly - 5th Edition (2024)

Green mortgages

To date, the poster child of scalable, commercially viable green home finance solutions is the Green Mortgage. Recognising the importance of this solution, the GFI has led a series of targeted interventions that have scaled the UK Green Mortgage market from three products to over 60 within just 4 years. These include:

- GFI identified lenders were not launching Green Mortgages due to perceived risk of greenwashing. To overcome this barrier, GFI developed the Green Home Finance Principles, in collaboration with the Loan Markets Association, a framework of guidelines to promote integrity in the market by providing FIs with a consistent and transparent methodology for the allocation of finance towards retrofitting.
- GFI identified that lenders did not have resources to inform commercial decision on Green Mortgages. GFI launched the Green Mortgage Hub and Lender's Handbook on green home technologies as trusted sources of information on the Green Mortgage market and retrofit technologies.
- GFI identified that mortgage brokers/intermediaries are a vital partner to distribute Green Mortgages. GFI published the Broker's Handbook on green home technologies to educate and raise awareness about energy efficiency and Green Mortgages amongst the broker community, complemented by the Certificate in Green Mortgages, a CPD approved training programme for brokers.
- GFI identified that market growth requires depth and breadth of engagement with lenders. GFI has supported >75% lenders with a Green Mortgage product through bilateral engagement and advice, while also convening industry events – such as the annual Green Mortgage Summit – to drive awareness and market growth.

The next phase of the Green Mortgage market will focus on providing greater support for energy efficiency improvements to homes – versus supporting the purchase of high-efficiency homes – and encouraging international adoption of the solution.

For green mortgages to scale further and transform the EU's residential landscape, regulatory incentives, financial innovation, and greater user awareness is required. For example, while the Spanish green mortgage market has grown to over ten products in the variable-rate segments, it faces challenges, including uncompetitive interest rates, lack of awareness and discrepancies in energy efficiency improvements assessments.[4] To consolidate the green mortgage market, a supportive legislative environment is needed.

4 ASUFIN - V Estudio Finanzas Verdes en España (2024)

Unsecured green home loans

While green mortgage solutions are increasingly available to help homeowners fund green home improvements, the unsecured green home finance market has also gained traction in recent years, driven by government incentives and regulatory frameworks. These loans support energy-efficiency investments without requiring collateral and are often priced competitively compared to traditional consumer loans, although specific features can vary by provider. Regulatory barriers, including consumer credit laws, create challenges for lenders seeking to offer these loans at scale.

The GFI has been actively addressing these challenges in the UK, publishing research to highlight market challenges as well as exploring and publishing information on solutions and tracking the availability of these products[5]. In the UK, availability of these loans doubled in 2024, reflecting growing demand for energy-efficient home improvements. Labour's Warm Homes Plan, as outlined in the manifesto, includes a commitment to collaborate with the private sector to introduce a government-backed low-interest loan. This reflects a growing commitment to scaling green home finance solutions.

Elsewhere in Europe, markets in Germany, Spain, and Denmark see robust availability, while Ireland is emerging as a rapidly growing market. The GFI's recently published paper, Unsecured Green Home Loans: Consumer Protection and Scale in International Markets explores how government-backed initiatives, financial incentives, and regulatory frameworks in these countries have helped expand access to affordable finance for energy-efficiency improvements.[6] By enabling securitisation of these loans, lenders can recycle capital efficiently, expanding their ability to offer more green home loans at competitive rates. Securitisation pools multiple loans together, transforming them into tradable financial assets that attract institutional investors, ultimately driving greater liquidity and scale in the market. Aligning with the Green Home Finance Principles, which focus on transparency, impact measurement, and effective governance can further support this process.[7]

5 GFI - Unsecured Green Home Loans
6 GFI - International Consumer Protections and Green Loans Report (2024)
7 GFI - Green Home Finance Principles

Demand aggregation financing

While green mortgages and loans can help homeowners finance energy-efficient improvements, they often cater to individual projects, which can limit the potential for cost reduction and scalability. Demand Aggregation Financing (DAF), aggregates multiple individual projects into a collective investment pipeline, creating economies of scale and reducing transaction costs to benefit homeowners. This increased scale leads to greater investor appeal by providing a larger, more diversified portfolio of projects, reducing risk and enhancing the potential for higher returns, making the investment opportunity more attractive to institutional investors and enabling broader access to capital. Such aggregation models could also support the securitisation of unsecured green home loans, helping to create a more scalable and investable asset class.

At the EU level, the Urban Agenda's Building Decarbonisation Partnership adopts an integrated approach, shifting from individual buildings to a district-neighbourhood model. As a direct partner, GFI contributes to scale and sustain integrated renovation programmes for buildings that are closely linked in terms of location, such as energy communities, energy sharing solutions, and positive energy districts, where communities manage an annual local surplus production of renewable energy. In Belgium, iChoosr's partnership with KBC offers financing for homeowners in group buying schemes.

These collaborations expand access to finance, broadening the potential pool of homeowners and boosting adoption of low-carbon technologies by reducing financial barriers. However, bringing similar models to the UK presents challenges, particularly around consumer credit regulations and lender risk perceptions. The GFI's Unsecured Green Home Loans: Consumer Protection and Scale in International Markets report explores these barriers and the lessons that can be applied to the UK market.

As-a-service solutions

The upfront cost barrier is a major challenge in adopting efficiency improvements. As-a-service solutions help to overcome this by offering a pay-per-use basis instead of requiring upfront purchases, reducing financial risk while ensuring continuous efficiency gains.

Models like Efficiency as a Service (EaaS) link payment to actual energy savings or system performance. To scale this, standardised energy efficiency metrics and certified savings are essential. In the LIFE GEAR UP project, GFI is piloting an on-bill financing solution, repaying upfront costs through billed energy savings tracked via smart metering. Once savings are standardised and certified, this approach can scale across securitisation markets, with long term and fixed cash flows for institutional investors.

Property-linked finance

Another innovative financial product that addresses upfront cost barriers is Property-Linked Finance (PLF), which ties financing to the property rather than the owner, enabling the transfer of payment obligations upon sale. It covers up to 100% of retrofit costs, with term of repayments aligned to the lifespan of these improvements.

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PLF originates from the Property Assessed Clean Energy (PACE) program in the US, a public-private partnership where financing is linked to property taxes. Variants of this model have been adapted as private-driven mechanisms in other countries. In the UK, a proposed new type of "Local Land Charge" could integrate PLF into property transactions. In Spain, the "PACE Canon" links periodic payments to the property rather than the owner, driving private investments in energy upgrades.

PLF has the potential to provide a new asset class for retrofit investments; with long term, stable income streams, it lends itself to the future securitisation of the underlying transactions.

Scaling up: the path forward

Scaling these solutions requires a coordinated approach that aligns policy frameworks, mobilises institutional investors, and creates financial structures to reduce investment risks. Key steps include standardising financial products to enhance liquidity and investor confidence, as well as developing green tagging standards for retrofit projects, making it easier for financial institutions to identify eligible sustainable investments. Additionally, building investable portfolios by aggregating demand and structuring finance to attract institutional capital is essential. Aligning incentives for homeowners, tenants, and investors ensures that all stakeholders benefit, while enhancing market transparency can drive greater adoption of energy-efficient solutions.

To successfully transition to a greener built environment, local-based solutions such as PLF, demand aggregation models, and green mortgages and loans must be integrated into a comprehensive strategy that bridges policy ambitious with real-world implementation. These solutions are crucial for scaling building decarbonisation, as they mobilise private capital and overcome financial barriers at the local level. By offering effective pathways to reduce emissions, enhance energy efficiency, and ensure resilience, these approaches are essential for achieving net-zero buildings.

Financing Nordic Cleantech – mobilising private capital

The Green Finance Institute (GFI) has operated in Denmark since 2023, engaging with investors and mortgage banks focused on crowding in private capital to close the investment gap in decarbonising real estate. Starting this year, and following the GFI model of "test, demonstrate, and scale", we are now analysing the barriers to scaling the Nordic cleantech sector and identifying the need for catalytic capital, building on work already underway in the UK and Brussels.

The Nordic market boasts a promising cleantech startup sector, with the potential to radically green global economies while simultaneously driving growth and enhancing Europe's position in an increasingly competitive landscape. Strong research institutions and government support enable a robust start-up environment, but few cleantech startups are well-positioned to scale.[1]

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A central barrier to these companies entering the market is the lack of scale-up finance. Moving from proven technology to first-of-a-kind (FOAK) production plant requires significant funding, often unavailable through debt, as these companies lack cash flow to service it.

1 Cleantech in the Nordics – Market study (2024)

Venture capital on infrastructure scale

A report from a group of Nordic public investment banks and credit agencies in 2024 estimated that Nordic Cleantech start up and scale up companies will need €15 billion in venture capital funding over the next five years to maintain previous growth rates.[2] Similarly, the Export and Investment Fund of Denmark estimated last year that cleantech startups and scaleups in Denmark alone will need approximately €1.42 billion over the next five years. Crucially, the Danish venture market specialising in cleantech, with actors such as Nordic Alpha Partners, Climentum, Vår Ventures, and CIP, has only an estimated €576 million in dry powder, implying an investment gap of over €844 million.[3]

This investment gap is particularly pronounced in the later stages of growth, buyouts and infrastructure, as illustrated by the attrition rates of Danish firms advancing from the first round of venture capital funding to subsequent funding rounds. Within the cleantech firms in the mobility sector, 58% progressed to a second funding round, 33% to a third and only 8% to a fourth round.[4]

The European Commission estimates that it will need at least €92 billion in investments into the six Net-Zero Industry Act strategic cleantech sectors to reach its goal of net-zero manufacturing capacity, meeting at least 40% of the EU's annual deployment needs by 2030.[5] Despite recommended public investments of €16-18 billion, a €50 billion investment gap remains in these six sectors alone.[6] Cleantech for Europe estimates that this figure could easily double once other strategic sectors are included.[7] Many are looking to the Commission's Clean Industrial Deal and the Competitiveness Fund to provide a much-needed boost.

2 Cleantech in the Nordics – Market study (2024)
3 EIFO: Dansk Cleantech – markedsanalyse (2024)
4 Cleantech in the Nordics – Market study (2024)
5 EU: The Net Zero Industry Act (2024)
6 EU: The Net Zero Industry Act (2024)
7 Clean Tech for Europe (2024)

The solution: convening, coordination and co-investing

With the philanthropic support of Breakthrough Energy, the GFI in Denmark is convening the market to design and implement solutions to this €50 billion gap in scale-up capital and mitigate operational FOAK risk for proven technologies for the growth phases of Nordic-based cleantech companies.

A central part of this work is coordinating actors across the capital stack to ensure that the risk, return and ticket size preferences of public, philanthropic, venture, and institutional capital are better understood when integrated into blended funding structures. The work will look at using a portion of concessional and high-risk capital to facilitate co-investment from lower risk capital. Such high-risk capital could stem from public funding, development financing, impact investors or governmental climate funds.

The GFI team is identifying the type of capital needed on a project-by-project basis to unlock change within specific venture segments. Equity investors in cleantech start-ups must have a clear path to scale and, ultimately the valuation and exit they seek. This requires a debt offering that is not currently available in the market at the required volume. The GFI will also design solutions that enable public funds to provide guarantees, price stability mechanisms and offtake agreements, that support price signals and underpin investor certainty.

Regional strong points

The GFI will focus on mobilising capital into sectors which the Nordic region holds a particular comparative advantage, namely energy, mobility, agriculture and manufacturing.

Data from the Investment and Export Fund of Denmark shows that cleantech companies in food and agriculture received more than a third of the combined venture capital investments between 2015-23, demonstrating Denmark's leadership in agricultural startups.[8]

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Across the Nordics, the region is well-positioned to drive a proliferation of agriculture and biomanufacturing industries given its long history with fermenting materials to generate value. For decades, precision fermentation processes, involving carefully selected microbial strains in closely monitored environments, have been the backbone across sectors in companies like Novo Nordisk, Arla and Carlsberg.

The GFI will collate viable solutions in a Nordic Cleantech Fund Playbook and identify go-to-market strategies for each. This could include partnering to set up new blended funds, as well as innovative methods to securitise revenue from new infrastructure such as decentralised renewable energy battery storage, to attract institutional investors.[8] Our aim is to identify the Carlsberg's of tomorrow, which can drive economic growth and the green transition.

8 EIFO: "Dansk Cleantech - Markedsanalyse" (2024)

Scaling Nordic expertise to drive project-level solutions

The Nordic opportunity is twofold: co-investing for cleantech scale up in the Nordic region but also exporting these cleantech solutions internationally to support greening the global economy, mobilising private capital, and boosting European competitiveness. This process requires organisations like the GFI who can bridge the gap between committed capital and impactful solutions. To address challenges of this emerging sector, we need to adopt innovative financial structures, radical collaboration and effective deployment of public capital to share risks with private capital and unlock investment to scale Nordic cleantech.

If you are interested in learning more about mobilising capital to close the scale-up finance gap in Nordic cleantech please reach out to comms@gfi.green

Place-based investing for green growth

Local leaders around the world face increasingly complex challenges as they strive to balance severe funding constraints with capacity and skills gaps. Faced with external pressures such as funding cuts, rising energy costs, and an increase in weather-related catastrophes, a solution for raising the finance for social and environmental projects may lie closer to home—within our communities.

Despite numerous opportunities for place-based action to drive resilience and decarbonisation, a lack of commensurate resources and capabilities mean local leaders are struggling to turn clean energy and wider net-zero ambitions into reality. Funding from central government is primarily allocated for project delivery rather than the preparation and development of viable projects. The resulting complex funding landscape leads to higher transaction costs, slower and inequitable access to project development and delivery funding across communities with varying resources.

An alternative approach is needed—one that funds place-based infrastructure projects that benefit communities while keeping constituents engaged.

Overcoming barriers in the UK

The Green Finance Institute (GFI) is focused on finding solutions to mobilise financing for local place-based projects. In the UK, councils are operating in a challenging fiscal environment, with limited borrowing power due to high Public Works Loan Board (PWLB) rates and soaring costs, making it difficult to deliver even core services. Since PWLB borrowing is underpinned by Gilt issuances, continued global instability and over-reliance on international investment have made borrowing expensive. English councils, in particular, have faced drastic funding cuts since the 2010s, with spending on some services reduced by up to 70%.[1]

While councils may feel financially constrained, they hold significant influence in addressing the climate emergency. According to the UK government's Net Zero Strategy, 82% of all UK greenhouse gas emissions fall within the scope of local authorities influence.[2] Since 2019, over 300 UK councils have declared a climate emergency.[3] Research commissioned by Innovate UK indicates that place-based net-zero initiatives generate more social value per pound spent compared to national initiatives.[4]

Given their considerable influence over the net-zero agenda, local governments and their constituents should be empowered to drive local initiatives that underpin regional and national prosperity.

1 IFS - What is the outlook for English councils' funding? (2024).
2 HM Government - Net Zero Strategy: Build Back Greener (2021)
3 Local Government Association - Delivering local net zero .
4 Innovate UK - Accelerating Net Zero Delivery: unlocking the benefits of climate action in UK city-regions (2022)

The opportunity of local investment

Community Municipal Investment (CMI)—also known as a Local Climate Bond—is an innovative green finance mechanism that provides councils with an alternative citizen borrowing option, delivering value for money while offering the potential to raise and deploy billions of pounds in private finance for environmental and social impact. Similar to the Green Gilt, CMIs comply with Green Loan Principles and have already funded key projects, including renewable energy installations, rewilding and biodiversity initiatives, electric vehicle charging points, school retrofits, and community climate funds.

In the UK, since CMIs were first developed and launched by Abundance Investment three years ago, 14 councils have raised over £11 million in private finance, with a strong pipeline of councils preparing to adopt the model—including interest from the broader institutional investment landscape.[5] CMIs are designed to save councils money by offering a lower cost of capital compared to PWLB loans. If the model were to capture even a fraction of the £1.5 trillion held in UK savings accounts, the savings on borrowing costs could be substantial.[6]

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Drawing on international experience, the UK's homegrown model has the potential to be replicated in new markets. The CMI model could form an integral part of the funding mix for local governments worldwide, advancing place-based climate action. It offers a new level of transparency by linking funds to specific projects, aligning with both local needs and national climate goals. This enables citizens to see exactly where their money is going, fostering stronger community engagement and, in some areas, sparking grassroots action.

It's now time to scale

Over the past three years, with market development support from the GFI and in close partnership with Abundance Investment, CMIs have demonstrated market viability and replicability. Now market-ready, as demand grows, the GFI will continue leading the CMI Steering Committee and help councils attract investment through the model to deliver greater environmental and social impact.

For CMIs to thrive, they require a supportive enabling environment—where municipalities have the freedom to borrow, alongside a regulatory framework that makes it cost-effective to raise funds from citizens. This typically involves the ability to start with smaller amounts to build market momentum. Supportive regulation and emerging crowdfunding platforms across the European Union and beyond create fertile ground for expansion. In the US, the $4 trillion municipal bond market provides further inspiration, demonstrating the power of enabling individuals to invest in their local communities.

In the coming years, the GFI's international offices will collaborate to share learnings from the UK and establish strategic local partnerships, scaling international versions of the CMI model.

For local governments, the opportunity is compelling: CMI is a powerful model to catalyse community resilience and address the fiscal challenges of green and social projects while making valuable contributions to nature restoration, energy security and climate action.

5 Abundance Invesments - Funding real green projects
6 FCA - Cash Savings Market Review (2023)

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