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White Paper: HOW BLENDED FINANCE CAN CATALYSE BUILDING RENOVATION

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BANKERS WITHOUT BOUNDARIES





FOREWORD

Foreword by Prof. Dr. Dr. h.c. Hans Joachim Schellnhuber, Director Emeritus of the Potsdam Institute for Climate Impact Research

We know that Europe is not on track to reduce greenhouse gas emissions to the extent needed to limit the rise in global temperatures in accordance with the Paris Agreement (1.5-2°C). The IPCC Special Report on Global Warming¹ states that achieving net zero in time means decarbonising at least six times faster than the global average. The Corona pandemic is teaching us that while unprecedented levels of change to the fabric of our societies and economies are possible, the burden of change is not distributed equally. In fact, the weakest members of our societies – the old, the young, the frail and the poor – are hit hardest by both the pandemic and our attempts at containing it.

A successful response to the climate crisis requires that we distribute the burden of change equally, not only because our moral compass demands it but also because it is simply more effective. This paper outlines an approach to achieve this in the field of building retrofit, based on on-going work with the City of Milan.

The built environment, responsible for about 40% of our carbon emissions, requires many and diverse actions to significantly impact our GHG emissions trajectory, such as better insulation to reduce heating emissions, more efficient heating systems, renewable energy, minimising construction waste, re-using materials and, in particular, switching to *carbon-negative* building materials such as timber grown by sustainable forestry. We have made great progress in constructing climate-friendly buildings that are increasingly affordable. These buildings shall become the gold standard for construction all over the world in the not-too-dis-

tant future. Another hard nut to crack though is the renovation of existing buildings. At present, Germany renovates about 1% of its existing building stock per year; this number needs to increase four-fold if the country is to achieve its climate targets.

In this paper, members of the EIT Climate-KIC community propose undertaking a "deep community retrofit" that scales up renovation at the district level rather than implementing piecemeal energy efficiency measures at the household level. Increasing the scale will not only boost the rate of renovation, but also generate co-benefits not possible on an "apartment by apartment" basis. They also propose engaging whole communities in the renovation of common areas to create the conditions for pooling investments and demand. This in turn will create the local construction jobs that are desperately needed to lift Europe out of the pandemic-induced recession.

The European Union clearly recognises the need for a wide-ranging transformation of its built environment and its construction industries and has recently launched a "New European Bauhaus" movement. I sincerely hope that the ideas outlined here will become one of its building blocks.



AN URGENT NEED FOR BUILDING RENOVATION

To achieve its emissions reduction targets, the European Union must urgently decarbonise its built environment. Buildings make up 36 per cent of its carbon emissions, 70 per cent of which from homes. In addition to reducing GHG emissions, the sector offers massive potential in savings in energy consumption: roughly 75 per cent of Europe's building stock is energy inefficient today, and almost 80 per cent of these buildings will still be in use in 2050². Without harnessing the potential of this sector, EU emissions targets will be very difficult to reach³.

Beyond climate and energy, improving the built environment offers significant opportunities for a more socially balanced transformation of the economy, such as creating local construction jobs and as a tool to alleviate energy poverty. For these reasons, the European Commission designated building renovation as a core activity in its 2019 European Green Deal and reaffirmed this in its post-COVID-19 economic recovery plan published in May 2020. At the European level, a "Renovation Wave" will be flanked by a comprehensive action plan of legislative and non-legislative measures and enabling tools.

Yet despite the political, economic, and scientific consensus on the benefits of and need for building renovation, the current rate of renovation is very slow. In Germany, for example, the rate is only around 1% per annum, far below the required 4% to achieve its climate targets⁴. How can we accelerate this process?

One approach is to undertake a "deep community retrofit" that scales up renovation at the district level rather than implementing piecemeal energy efficiency measures at the household level. Increasing the scale will not only boost the rate of renovation, but also generate co-benefits not possible on an "apartment by apartment" basis, such as better community healthcare outcomes. Engaging whole communities in the renovation of common areas creates the conditions for pooling investments and demand, offers incentives for innovation in the supply chain and alternative ways of funding, and opens possibilities for co-creation between local residents, designers and business.

Well-designed finance solutions, such as the blended finance structure presented here, are crucial to unlocking these opportunities and combining different sources of funding towards one combined goal. The EU calculates the extra investment needed annually to reach its energy and climate targets until 2030 at around €325 billion⁵, with approximately €250 billion for residential and €75 billion for public buildings. This is almost twice the € 172 billion EU budget for 2020⁶, which highlights that no single actor – even governments – can tackle the problem alone. Thus, a combination of institutional, public and potentially retail funding is needed to achieve the required investment level.

A Blended Finance model can help meet this need. Private resources fund the elements of community renovation that bring positive financial returns, while philanthropic and public funds invest in the aspects of renovation that deliver the highest social and environmental impact. Combining these resources through Blended Finance unlocks opportunities for deep community retrofit projects on a much larger scale, which in turn accelerates the rate of building renovation needed for meeting EU climate targets. Adding retail funding sources can empower citizens to be involved in large scale retrofit of their own communities. Citizen engagement will be key to foster large scale retrofit across Europe.



WHY IS INCREASING THE CURRENT RENOVATION RATE SO DIFFICULT?

There are some major barriers to increasing the rate of renovation. Blended finance offers an innovative and efficient approach to address multiple interconnected issues from a systemic perspective, which we will outline shortly.

Current hurdles include binding yet conflicting regulation, a lack of financial resources at the required scale, a lack of demand aggregation (combining purchases of goods and services to obtain better value for money), the need to enhance potential financial tools, poor citizen engagement and incentives, agency issues driving a lack of economic incentives for community renovation, and a supply chain incapable of delivering mass renovation at an industrial scale.

A CONFLICTING AND COMPLEX REGULATORY ENVIRONMENT

There is no shortage of rules and regulations aimed at reducing carbon emissions in Europe's built environment, but international and national energy and climate action policies do not always match. Pacts and directives like United Nations' Paris Agreement, the EU Climate and Energy targets and the EU Energy Performance of Buildings Directive (EPBD) or Germany's Plan for Climate Protection 2050 (Klimaschutzplan) and its Building Energy Law (Gebäudeenergiegesetz – GEG) contain conflicting yet binding requirements. At the European level, for example, definitions in the nearly Zero Energy Buildings (nZEB) directive differ considerably among member states, as shown in Figure 1 (pictured).⁷

A complex mix of regulatory and related issues also exists at various levels. Germany, for example, suffers from a combination of weak regulation, contradictory tax rules and a lack



Figure 1

of transparent energy costs. Such complexity undermines pressure on building owners to renovate their stock. Externalities, such as the (carbon) price for energy, which is still too low to change behaviours, and the need for clean energy subsidies, also contribute to this. In its recent strategy paper on the building "Renovation Wave", the European Commission cites the possibility to strengthen the European Emissions Trading System (EU ETS), the market governing the price of carbon.

One regulatory game-changer for financial institutions in the building sector will be the Commission's new classification system for environmentally sustainable investments. The EU Taxonomy for Sustainable Activities⁸ will come into force by 2021 and is one of four critical Environmental, Social and Governance (ESG) regulations in the EU's Sustainable Finance package. It provides incentives to financial institutions to consider sustainability information in building valuations, loan provision and bond definition. Institutions across Europe are actively following developments and preparing to provide verification of how they apply these classifications to the construction sector.

Also relevant for boosting renovation are current limitations to implementing a long-term heating, power and comfort fee that could replace a significant portion of the energy and heating bills for consumers. Introducing such a fee in a project like the one we describe below is crucial to radically reduce legal and financial uncertainty for renovators, investors, and residents. National energy authorities tend to have strict regulations for the provision of energy to citizens, developed over the last thirty years, which aim to guarantee market transparency and secure provision of this essential commodity.

SIGNIFICANT CAPITAL REQUIREMENTS

The traditional – and inadequate – approaches to building renovation are failing to attract the necessary scale of investment. The German government's post-COVID-19 recovery package, for example, has earmarked €2 billion for building renovation, while the EU invested €600 million in the Energy-efficient Buildings Public-Private

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Partnership under Horizon 2020, which ran from 2014 to 2020. Compare this to the €325 billion in buildings investment the EU says is required annually to meet emissions targets by 2030. Clearly, public sector efforts alone are unable to generate the capital volume required.

And it is not just a matter of the volume of capital, but how it is applied. Current models generally consist of combining subsidies (often through the tax system) with low-cost finance. However, building owners are not taking up these offers to the required degree⁹ due to the agency issue of the disconnect between the investment decision and the receipt of economic benefits (unless fully reflected in house value or the owner is committed to being resident for 30+ years). A new way of organising and disbursing capital is required.

LACK OF AGGREGATION AND SCALE OF PROJECTS

Aggregating "packages" of buildings in need of renovation would allow for economies of scale, industrialisation of building parts, smaller transaction costs and faster renovation services; though in practice this is difficult to achieve. It also combines investible projects at a scale that institutional finance can engage with.

Figure 2 below gives an indication of how heterogeneous Europe's built environment is, as the



15%

15%

Source: "Europe's buildings under the microscope" (BPIE 2011)





MFH breakdown by age bands

year of a building's construction determines not only many of its architectural and functional characteristics, but also the standards in place when it was erected.

Another critical cause of dispersed demand is ownership: in Germany, 45.5 per cent of households live in rented accommodations¹⁰, well above the EU-27 average of 30 per cent¹¹, plus the majority of building owners own a relatively small portfolio. This creates a potential misalignment of incentives between the problem owner and the benefit recipient.

LACK OF CITIZEN ENGAGEMENT AND UPTAKE

Another crucial issue is motivating residents, owners, and owner-occupiers to engage in a complicated retrofit project.

Building renovation is often viewed as a complex undertaking. It requires technical knowledge to understand how a building can be retrofitted. Along with legal and regulatory considerations, there is the cost aspect, which often requires financing through debt and is associated with uncertain long-term future savings. This complexity and uncertainty make it harder for individuals to decide if they should take on the associated risk.

Building owners and residents who renovate their dwellings must engage with different service providers. They need a basic understanding of building regulations (unless they have a trusted supplier), they must deal with financial institutions, and they must choose between a multitude of options that can easily overwhelm anyone who is not a retrofit expert.

Finally, not all retrofit is created equal. Deep retrofit targeting net zero emissions is not the most economically viable, so even if citizens are engaged, the outcome may be hampered by financial constraints, leading to superficial decarbonisation.

A SUPPLY CHAIN INCAPABLE OF DEALING WITH RENOVATION AT SCALE

The transformation required in building renovation goes beyond the financial world. Even if innovative financial schemes supply sufficient capital for large-scale retrofit, the supply chain as it is configured today would not be able to deliver the products and services in time. This is because until now building renovation has been approached one building at a time, with individual projects financed through siloed funding programs and contracted by one person or company. The supply chain is organised to provide what this approach demands: unit-specific projects, with lengthy retrofitting in each building, using products and services suited for that particular case.

To achieve the needed level and scale of transformation, the supply chain must be redesigned and improved, and here the keywords are scalability and industrialisation. Again, under the current model, no single actor can produce the systemic change required. Even if off-site technological solutions are available, it is impossible to scale up and industrialise supply if demand is scattered and finance small-scale. Key components in driving this redesign and scaling of the supply chain are long term policy certainty and deliberate actions to create the Lead Markets that will foster supply chain investment.

The good news is that a successful transformation of this nature would generate considerable economic activity and employment opportunity, something surely needed in the current environment.

LACK OF ECONOMIC INCENTIVES FOR COMMUNITY-WIDE RENO-VATION

As shown below, the economic case for building renovation is only attractive for light retrofit, characterised by measures to improve energy efficiency. This first level is only good for reaping low-hanging fruit – mainly cheaper energy bills but struggles with low take-up.

Deeper retrofitting measures reduce overall energy demand, enable more efficient energy usage and often employ renewable energy technologies. Although indispensable to the decarbonisation of the built environment, these measures do not result in positive economic returns under the current state of technology and implementation possibilities. Initiatives at the unit-level fall far short of achieving the required transformation, so that new ideas and actions far beyond deep retrofit are required to unlock system-wide, deep *community* retrofits. These include measures to improve and benefit entire neighbourhoods, along with the greening of infrastructure. Such actions can – and should – be co-designed by neighbourhood residents themselves, to improve not only buildings but community life as a whole. Such broad and deep community renovation will, in most cases, offer very little or no financial return, but will likely be crucial to driving the necessary engagement of communities in this process.

Going beyond the individual residential unit offers opportunities for public non-monetary returns from improving parks, green spaces, community centres and the like, with benefits for future healthcare costs, improved productivity and more.

Figure 3

Source: Bankers without Bounderies

WHAT IS DEEP COMMUNITY RETROFIT?

Category	Examples	Comment	
Positive Returns	Solar PV/ some thermal Improvements	Economics positive – take up still low	Light Retrofit
Negative Returns	Deeper demand mitigation, renewable heating	Required for deep decarboni- sation – economics negative	Deep Retrofit
No Returns	Green Infra / Coummunity investment	Community regeneration at a lower marginal cost – no direct economic	Deep, Community Retrofit

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BLENDED FINANCE AS A LEVER OF CHANGE

Facing the set of challenges outlined above, progressive stakeholders in construction, renovation, finance and sustainability are promoting an innovative approach to blended finance to broadly address these issues from a systemic perspective.

The Blended Finance model is a way of driving new incentives into the current system to bring about transformation at the required urgency and scale so Europe can meet its climate targets. The idea is to blend private, philanthropic, and public financial resources into a single fund, which can then deliver high-scale, deep community retrofits – thus triggering additional positive changes in the whole system.

The underlying idea is that community renovation is not a homogeneous activity that pays a given return under a fixed risk. Instead, community renovation consists of different activities, or layers, each with its own returns. Therefore, it is useful to deconstruct the work into these specific layers to understand what financial (and non-financial) potential is associated with each.

The most positive economic returns are usually attained in light retrofit measures, especially energy efficiency measures and local electricity generation through proven technologies like rooftop solar. In this approach, future energy savings can be used to repay the upfront costs, resulting in a positive Internal Rate of Return (IRR).

The second layer of community renovation is composed of deeper retrofit measures, like more substantive energy demand mitigation efforts, heat source replacement and combined heat and power (CHP) solutions. These initiatives are indispensable to the deep decarbonisation of the built environment, but the savings they elicit, although able to return some of the invested capital, are not enough to generate a positive IRR on their own.



Finally, there is also the need for deep community renovation efforts. These include social and infrastructure enhancements, like community centres, parks and greenery between buildings. Those public or social elements return no capital directly, so they are not suitable for funding by traditional financing schemes but are critical to delivering the overall project by engaging with communities.

Under the model of Blended Finance, all these components are brought together in one fund, in a way that leverages each component's impact and takes advantage of the fact that, as "placebased" interventions, the marginal cost of delivering each may be lower when done together. For example, scaffolding on one building may serve several different interventions. The fund is composed of layers matching the funded object, so private money is directed towards the most compelling economic case, philanthropic or development resources are directed to the middle layer of deeper retrofit measures, and public grants are used to finance infrastructure work, where they can provide maximum societal benefits. The fund works with a tiered risk approach, where senior shareholders – those bringing minimum risk capital – only suffer losses after all capital from the other subordinate shares is consumed.

Essentially, this model allows available governmental resources (e.g., stimulus packages, social programmes, grants) to crowd-in private funding and materially amplify the capital available for infrastructure development. This dynamic can create a genuinely scalable model, well over and above what can be supported by government funding alone, thus addressing one of the main barriers to implementing building renovation at scale. From a financial perspective, such a model provides extra security to private investors since they hold senior shares over the other shareholders. Private initiatives also benefit from the possibility to create impact through ESG activities, allowing asset managers to satisfy investor demands for social and environmental responsibility.

Blended Finance models can also be used to address other essential aspects of building renovation, such as citizen engagement and lack of demand aggregation. When such schemes are put into practice, the multi-layered and scaled-up capital allows for new and innovative approaches harnessing community participation, as illustrated in the case of the Milan Transformation Fund 2026 below.

With much higher capital volumes, such funds can engage in retrofits at the block, neighbourhood and district levels, unlocking new possibilities for systemic change. For example, at this scale, it is possible for local residents to work with stakeholders, co-creating the space they want to live in. In turn, this engagement with local communities facilitates demand aggregation by helping align community goals with the work of the renovation fund. This generates economies of scale through lower marginal costs and even allows for new ways of income creation that would not be possible at the individual building level.

One extra benefit is that centralised expertise is brought to the technical, legal and financial complexities rather than leaving those issues to each individual building owner. Citizens can engage with this process, but it is not necessary for implementation, thus removing another key barrier to scaling up. In this model, even the debt present in individual renovations is taken off the individual and is instead contracted by the fund entity. Residents pay a "heat, energy and comfort" fee, which removes any psychological barriers to adoption – since the costs are grouped in a single fee - and also addresses any potential misalignment of incentives between building owners and tenants in the rental sector, since tenants pay for the comfort they receive and building owners do not have extra costs to renovate their property.



THE CASE OF THE MILAN TRAN-SITION FUND 2026

The concept of Blended Finance will be tested in practice at a local (Milan Transition Fund-2026) and regional level (Regional Energy Efficiency Transition Fund **(REETF)** in Milan and Zagreb). The goal is to deliver urban regeneration through environmental (decarbonisation and green infrastructure), social (community life improvement) and economic (increased value and job creation) impacts.

In the case of Milan, the structure is being established and trialled in one specific area of the city with renovation work planned for 2021 in an initial pilot of 250 units, with a view to scale to 10,000 units by 2023. The base funding comes from the ECOBONUS, a 110% tax deduction provided by the national government to its citizens on an individual level. The initiative then aggregates a community of citizens and uses their tax deductions to create a first layer of a blended finance fund. On top of this, there are efforts (presentation to financial stakeholders of the investment opportunity) to attract development capital through institutional and international investors and also results-based private investors, as described above. The concept requires setting up an entity that manages the fund and is jointly controlled (public and private entities) to design the community retrofit work, contract all services, charge the "power, heating and comfort" bills and manage the data that reflects and measures the impact of the work done, so the various stakeholders and investors can be informed of the impact their funds are having.



One crucial aspect of the project is bringing together citizens and stakeholders to create real engagement, allowing for bottom-up approaches and insights. There is interest in raising local awareness for the financing stream, to activate economies of scale by facilitating and building tools for self-organisation. The project creators also want to enable a bottom-up contribution to shape the project's innovative financing scheme, focusing on the contracting mechanisms with residents.

The project builds on a series of previous initiatives co-funded by EIT Climate-KIC over the last two years, that allowed the partners to analyse the Milano context and fine tune the fund concept, where the preliminary notion of developing a financial instrument linked to decarbonisation and building retrofit was explored.

Concerning the supply chain, the Milan Transition Fund is pushing forward a new retrofit approach, where some refurbishment components are manufactured off-site at industrial scale, allowing for much lower costs in terms of financial resources and time. This is only possible because of the previously generated demand aggregation through citizen engagement, creating bulk demand for the new off-site technologies and enabling investments that strengthen the supply chain. Regarding service providers, priority will be given to those with an innovative attitude towards building renovation, using sustainable construction methodologies, digital infrastructure, and user-driven design processes, as the European Commission outlined in its strategy for a "Renovation Wave".

supported, as EIT Climate KIC's work on the Milan Transition Fund is demonstrating.

The approach to a 'Deep Community Retrofit' outlined in this paper may appear complex at first, as it requires finding the right balance in simultaneously targeting multiple goals: improving the economics of retrofit by reaping the benefits of greater purchasing power, while driving innovation and creating opportunities for local community wealth-building and supporting local business. It requires a pricing mechanism that moves energy savings to the central fund without removing incentives for good energy behaviour and generates a lever to combat energy poverty. It is also necessary to solve contracting challenges, so that a long-term heating, power and comfort contract between residents and the fund can be created, and so that new owners and residents can take over as the old ones move out.

However, these issues can be solved if there is sufficient political will to try new approaches. It requires willingness to experiment and an understanding of the urgent need for systemic change to limit the rise of global temperatures. Blended Finance enables different types of funding capital to achieve their respective objectives facing their correspondent risk level. To fully unlock its transformative powers, it needs to bring together diverse stakeholders, thus increasing resilience in communities and allowing them to thrive.

What is more, the co-benefits of local job and revenue creation are significant and much-needed as Europe moves into the first year after the outbreak of the Corona-pandemic.tbk

CONCLUSION

The challenge of significantly increasing renovation rates – fourfold in the case of Germany - must be urgently addressed but also brings new possibilities and opportunities. Leaving the "apartment by apartment" logic is entirely possible when a Blended Finance model is applied and

ENDNOTES

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ABOUT EIT CLIMATE-KIC

EIT Climate-KIC is the EU's climate innovation initiative, working to accelerate the transition to a zero-carbon and resilient world by enabling systems transformation. Headquartered in Amsterdam, it operates from 13 hubs across Europe and is active in 39 countries. EIT Climate-KIC was established in 2010 and is predominately funded by the European Institute of Innovation and Technology (EIT), a body of the European Union.

As a Knowledge and Innovation Community (KIC), it brings together more than 400 partners from business, academia, the public and non-profit sectors to create networks of expertise, through which innovative products, services and systems are developed, brought to market and scaled-up for impact.

www.climate-kic.org

NOTE

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