

Intervention #4

Financing the retrofit challenge

Intervention point

Financing the retrofit challenge is expensive and requires new alternative financial solutions for the built environment. These solutions need to consist of a blend of public and private sector actions, including increased data collection, more extensive risk modelling in the light of strongly expected policy changes, and the design of blended finance products that mobilise capital at the required scale.

Current situation

Buildings are responsible for 37 percent of global CO₂e emissions with 10 percent embodied emissions from construction, materials and maintenance and 27 percent from lifetime operational emissions.¹

With 80 percent of the predicted 2050 building stock already existing today,² Europe is in desperate need of retrofitting at scale to meet the EU's Paris-aligned 1.5°C goal, which is a 55 percent GHG reduction by 2030 based on 1990 levels, and net zero by 2050.³ Currently, 75 percent of the EU building stock is considered to be energy inefficient and less than 1 percent per year is undergoing a retrofit.⁴

With real estate managing major structural changes such as the use of office buildings post-pandemic and the impact of e-commerce on retail, the decarbonisation of buildings does not just depend on financing but also other actions such as speeding up planning processes, encouraging repurposing of building uses and increased density. However, where these solutions are not as readily available, some of the main barriers revolve specifically around financing – the focus of this intervention.

While there is a growing urgency to retrofit the European building stock to achieve climate goals, there remains a hugely significant investment gap,

as retrofits that involve building electrification and energy efficiency measures can be expensive.

The European Commission estimates the annual necessary investment into the building stock at €325 billion. In comparison, the total EU budget in 2020 amounted to €172 billion.⁵

A number of levers are already being pulled in order to stimulate private sector demand for retrofits and consequent financing. Policies across the continent – despite not having delivered the right incentives to decarbonise the built environment to date – are becoming increasingly ambitious as seen through the several recent examples: the latest revision of the EPBD in 2023, despite a fairly recent revision in 2018⁶; the Renovation Wave for Europe⁷; the EPC minimum standard requirement in the Netherlands⁸; or the *Décret tertiaire* in France.⁹

In addition, more large multinational corporations commit to ambitious net zero targets, and sustainable finance regulation is becoming more stringent such as through the EU Taxonomy, making investors increasingly demand net zero assets.

With increased need to transition to a low-carbon mode of operating, real estate assets are at a higher risk of stranding. Transitioning buildings through a deep energy retrofit can be costly, and, so far, these costs have rarely been included in capex forecasts. As a consequence, they are more

Transition risks are climate-related business risks which emerge from societal and economic shifts as we transition to a low-carbon future. They can include regulatory, technological, market, reputational and legal risks.¹⁰ Estimation of financial impacts of transition risks on building valuations are still difficult to isolate, as they may regularly be blurred by factors such as location, age or quality of tenant, and may only be observed in the longer term, but with short-term capital expenditure requirements for mitigation. For more information about the role of transition risks in the built environment, see the *C Change Intervention #1 Transition risk-adjusted valuation*.

likely to prematurely devalue due to issues related to political and market shifts.

Buildings have a long economic life and the costs of transition have not been incorporated into this. Further, they are not just financial assets but also contribute to the physical infrastructure of people's daily lives and have a strong social value, which is at risk if not maintained properly.

Asset stranding is a critical risk for investors, and it is also bad for cities. It is important to maintain the quality of the urban environment and have the physical infrastructure of cities in-use rather than abandoned. Otherwise, this poses risks of urban degradation and could cause a snowballing effect that can result in negative social outcomes such as reducing people's wellbeing and increasing levels of crime. Certainly, there are assets that are at a higher risk of stranding such as affordable housing and obsolete offices which have the potential to aggravate these social issues.

From a more holistic perspective, mixed-use pedestrian spaces, well-structured building layouts, public transport and neighbourhood stability are important quality of life metrics for the competitiveness of a city, which is important to attract skilled migration and avoid depopulation. In theory, the threat of asset stranding within the city context should stimulate asset owners into retrofitting their buildings to preserve their portfolio value.

At the same time, the larger scaling of retrofits across Europe is being held back significantly, among other issues, by the lack of supply of financial products for such initiatives, due to the related cost and uncertain returns. There are also practical barriers, which is discussed in *C Change Intervention #5 Building renovation passports* or *C Change Intervention #2 Tenant and landlord alignment*.

At an asset level, deep retrofit cost estimates for an average UK house are 40,000 GBP, but for different asset classes the cost of an ambitious project can be "huge".¹¹ For example, in 2022 Oxford Economics estimated the office renovation cost to extend economic life by 10-15 years on average in Europe to be 17 percent of capital value. For industrial buildings, the estimate amounted to 11, and for residential 17.5 percent.¹²

In addition, the current supply chain configuration is insufficient to deliver large-scale retrofit efforts,¹³ skilled labour to deliver on the scale of these projects is lacking,¹⁴ and expectations are that retrofit costs will remain high in the near future.¹⁵ In fact, the continuing risk of cost inflation due to increasing demand as retrofitting enters into the mainstream may provide an incentive to act sooner rather than later.

The business case for the retrofit of different asset classes, jurisdictions and geographies remains unclear. While there is increasing evidence that energy efficient ("green") buildings are better investments than inefficient ones (see, for example, the recent report of the Energy Efficiency Financial Institutions Group EEFIG on mortgage defaults of energy efficient assets),¹⁶ there is still the need to gather a lot more up-to-date quality information on the financial performance of retrofits (see *C Change Intervention #8 Energy efficiency data*) to de-risk such investments.

Returns on the energy efficiency retrofit to repay the cost of such investments stem mostly from the energy savings which, under usual circumstances, are relatively low in comparison. Some models have suggested that, even on a 30-year payback period, the internal rate of return for an average house may be negative.¹⁷

The business case for retrofit may be asset-specific, but it is clear that – all other things being equal – the payback period must be extensive, potentially binding the building owner to the asset.¹⁸ This is under the realistic assumption that the transition risk mitigation expenditure, which occurs by retrofitting an asset, is not yet being adequately considered in transactions.

Even if there was a positive internal rate of return (IRR) on a retrofit investment, there remains the “split incentive” problem. Retrofits which yield lower utility costs are usually paid for by the asset owner, while the tenants benefit from the utility cost savings. Currently, most rental contracts are set out so that utility bills are not included in the rent.

Solution attempts to these problems have been made through so-called “green leases” (see more below), which allow cost sharing of more sustainable building operation or investments, but the extensive payback period remains to pose problems due to relatively shorter tenant lease contracts. This set-up presents another significant financial barrier to independent retrofit projects.

Another set of options to be explored is the financing of costly retrofits through concurrent measures that increase the value of assets and thereby achieve higher returns, leading to shorter payback periods. Such options include the usual measures around building upgrade renovations, but also densification, repurposing of buildings (especially now during the credit crunch effects on commercial office space¹⁹), accelerated planning processes through more transparent municipal decision making, and other, more practical initiatives that leverage increasing asset value in order to finance decarbonisation.

These financial barriers present significant challenges additional to all the practical difficulties associated with increasing the rate of retrofit, and they have urgency to be addressed by solutions that go beyond the usual debt financing.

What is being done

Despite the cost of retrofit and the long payback period, a lot of effort is being put into financial solutions to de-risk such investments through:

- (i) data collection to show statistically significant results of expected positive IRR

- (ii) transforming transition risks into financial materiality to see the benefit of retrofit and adjust the norms of transaction
- (iii) establishing financial solutions such as green leases
- (iv) innovative financing solutions through blended finance

i) Data collection

There are initiatives involved in collecting energy efficiency data to show that retrofit can be financially as well as environmentally sustainable, such as the EU's DEEP database, or the Energy Efficiency Financial Institutions Group (EEFIG). For more details on this intervention point, please see the *C Change Intervention #8 Energy efficiency data*.

ii) Transition risks estimation

The ULI C Change programme has launched a common methodology to transform transition risks into financial materiality, which allows retrofit, as a method of transition risk mitigation, to be considered in discounted cash flow analyses for real estate valuations and asset transactions (see *C Change Intervention #1 Transition risk-adjusted valuation*). This is a significant development considering the barriers outlined above. Retrofit investments are higher risk if their associated risk mitigation effects are not recognised by future transaction partners, meaning that the energy efficiency and low carbon impact of a building is not appropriately appraised by the buyer, leading to a loss.

iii) Widespread enabling instruments - green leases

Green leases are agreements between tenants and owners to work together and share cost and reward in sourcing energy from renewables, reducing emissions and decreasing waste and water use. While green leases cover a significant proportion of all rental agreements and some argue that these agreements are “instrumental in driving decarbonisation”,²⁰ the concept of a green lease has been around for over 10 years and has yet to show the potential to deliver to the scale that is necessary for the timely decarbonisation of the building stock. The challenge lies in the definitions and requirements of green leases, as well as in making the agreement and getting to terms about the enforcement.

iv) Innovative financial solutions

EIT Climate-KIC and Bankers without Boundaries (BwB), in their analysis of the size of the investment gap of the retrofit challenge (€325 billion annually),²¹ propose a framework of blended finance, meaning co-financing of retrofitting solutions through public, philanthropic and private funds. Due to the extensive payback periods, the low returns and the risks that are involved, the proposition is that, through a non-repayable layer of finance, a de-risking of retrofit investments can take place, which incentivises private capital to co-fund the retrofit challenge.

There can be a number of sources for a blended financing solution:

- Public participation in the transformation of the local municipal environment could be offered to the community through a community bond-type structure, allowing people participation in the returns.²²
- Due to the huge amount of money required as well as the long-term nature of the problem, BwB suggests that municipality finance may have to extend its toolbox from an “incrementalist annual budget mindset”²³ to considering investment programmes as part of the solution.
- Non-repayable layers could be sourced from existing municipal budgets earmarked for improving energy efficiency, existing subsidy schemes, additional national grant funding aimed at decarbonisation, or other outcome seeking pools of funding such as healthcare or biodiversity budgets. Given the increased stranding risk of some assets (obsolete offices, affordable housing, etc.), public money for the prevention of urban degradation could also be made available. The exploration of the potential to accredit centralised and scaled retrofit programmes as source of carbon credits²⁴ could also be considered.

An example of a successful partnership between a municipality and the private sector is the [Bristol City Leap](#) project, which aims to remove 140,000 tons of carbon across the city by delivering low carbon energy infrastructure, such as solar PV, heat networks, heat pumps and energy efficiency measures at scale. The project includes over £400 million of private sector capital.

The Green Finance Institute’s (GFI) Coalition for the Energy Efficiency of Buildings Europe (CEEB) is bringing together leaders in finance, real estate and energy sectors, and across policy, academia and non-profit organisations in order to co-develop the innovative financing solutions that can close the investment gap presented by the retrofit challenge. A recent list of examples of different public and private financing initiatives can be found in the GFI’s recent report *Unlocking the Trillions*.²⁵

Possible next steps

Financial solutions for the retrofit challenge fall into two broad categories, namely de-risking the investments and providing the financing.

For de-risking the retrofit investments, data collection and analysis of energy efficiency in combination with returns on investment for retrofit for all asset classes and across all geographies and jurisdictions with different building codes needs to scale. Such databases will allow for better understanding and investment decision making. For more information on this, see *C Change Intervention #8 Energy efficiency data*.

In combination with this, exact financial implications of transition risks need to be worked out across the same spectrum of asset classes. Once these risks are expressed in financial terms and it becomes clear that energy efficiency and resilience measures are necessary to avoid a loss in value, the case for retrofit becomes a lot stronger. For more information on this, see *C Change Intervention #1 Transition risk-adjusted valuation*.

For enabling the funding at the required scale, innovative financial solutions have to be developed, and – on a more granular level than best practice examples – they may have to be specific for different municipalities. For example, possibilities of district heating, renewable energy generation and accompanying infrastructure differ across the existing infrastructures of different cities. Equally, the stakeholders differ in their resource availability, their retrofit readiness and the municipality does in rates of owner-occupied assets. The reality is that blended finance investment vehicles must be adapted to the multidimensional idiosyncrasies of the target cities and only as such will be effective. The work that needs to be done in this respect

is the stakeholder involvement and investment management, for which special administrative units must be created. For more extensive research on the topic of possible actions to take for municipal blended financing units, see *C Change Intervention #10 Building capabilities for blended finance*.

Additional solutions to be explored revolve around creating value through repurposing of old building stock and seeking out opportunities that have been created through the Covid-19 pandemic. Underused office parks as a consequence of the rise of the home office present a new possibility of financing retrofit through prudent and creative investments.

How to get involved

To de-risk energy efficiency investments, data and knowledge sharing of cases is invaluable. Initiatives such as the De-risking Energy Efficiency Platform (DEEP) may be used for this, but other energy efficiency initiatives do similarly important work. For further details, see *C Change Intervention #8 Energy efficiency data*.

ULI C Change launched its Transition Risk Assessment Guidelines on how to convert transition risks into financial materiality in June 2023. Further, ULI is planning to develop a tool to support its implementation.

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ULI C Change will be conducting a case study of asset stranding risk, as well as possible risk mitigation strategies in Berlin throughout the year 2023. ULI members will be invited to participate. Initiatives such as GFI's [CEEB](#), EIT Climate-KIC's [Net Zero Cities](#), [Bankers without Boundaries](#), [Dark Matter Labs](#) (e.g. [Neighbourhood Finance Retrofit](#)) continue to research and produce prototype solutions for the challenge of financing urban retrofit. Sign up to newsletters for updates.

About C Change

C Change is a ULI-led programme to mobilise the European real estate industry to decarbonise. We're a movement empowering everyone to work together for a sustainable future. We connect the brightest minds from across the value chain. We challenge barriers, share expertise, and champion innovation to move swiftly to accelerate solutions that will transform our industry and protect our planet. C Change means real change.

C Change was formed in late 2021 by a group of leading real estate players that was united in its aim to focus on collaboration to ensure companies large and small have access to practical solutions and education on decarbonisation.

About these intervention briefings

This is one of a suite of intervention points developed as part of the C Change programme. Intervention points are specific places within a system where we can target action, interrupting business as usual to drive transformation. Of course, systems are dynamic environments that are always in flux. We expect movement over time, and will update this document as prevailing and anticipated trends change shape. This briefing was researched in 2022 and published in 2023.

- 1 [GlobalABC: Tracking progress](#)
- 2 [McKinsey & Company: Call for action: Seizing the decarbonization opportunity in construction](#)
- 3 [European Commission: Paris Agreement](#)
- 4 [European Commission: In focus: Energy efficiency in buildings](#)
- 5 [EIT Climate-KIC: How blended finance can catalyse building renovation](#)
- 6 [European Commission: Energy performance of buildings directive](#)
- 7 [EUR-Lex: Communication from the commission to the european parliament, the council, the european economic and social committee and the committee of the regions: A Renovation Wave for Europe - greening our buildings, creating jobs, improving lives](#)
- 8 [Leiden International Centre: C energy label compulsory for office buildings from 2023](#)
- 9 [Schneider Electric: Décret Tertiaire: One Year For French Building Owners to Comply](#)
- 10 [GRESB: Transition Risk Report](#)
- 11 [EIT Climate-KIC: Green neighbourhoods as a service](#)
- 12 p1, chart 1. [Oxford Economics: Europe's renovation race to net-zero](#)
- 13 p8 [EIT Climate-KIC: How blended finance can catalyse building renovation](#)
- 14 [Euronews.green: An 'army of plumbers' is needed to slash home heating emissions in the UK, says new report](#)
- 15 p4 [Oxford Economics: Europe's renovation race to net-zero](#)
- 16 [Publications Office of the European Union: The quantitative relationship between energy efficiency improvements and lower probability of default of associated loans and increased value of the underlying assets](#)
- 17 [EIT Climate-KIC: Green neighbourhoods as a service](#)
- 18 p7 [EIT Climate-KIC: Green neighbourhoods as a service](#)
- 19 [Financial Times: Financial storm bears down on US commercial real estate](#)
- 20 [JLL: How are green leases supporting real estate's decarbonization drive?](#)
- 21 [EIT Climate-KIC: How blended finance can catalyse building renovation](#)
- 22 [EIT Climate-KIC: Green neighbourhoods as a service](#)
- 23 [Bankers without Boundaries: Innovative Finance for Cities Tackling the Net-Zero Carbon Transition](#)
- 24 [EIT Climate-KIC: Green neighbourhoods as a service](#)
- 25 p14 [Green Finance Institute: Unlocking the Trillions](#)

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