

Intervention #8

Energy efficiency data

Intervention point

Unless the gaps in energy efficiency data are filled, the financial case for retrofit will continue to be unclear, hampering willingness to invest and reducing the opportunities appropriate incentives across the value chain.

Current situation

If the real estate industry is to meet its decarbonisation targets, it must electrify and reduce energy usage within buildings. In Europe, around 80 percent of the 2050 building stock already exists today.¹ Renovating existing assets is a critical element for meeting climate targets and currently 75 percent of buildings in Europe are not considered to be energy efficient.² This means they have an Energy Performance Certificate (EPC) rating of between D and G, or none at all.

Real estate's "fragmented and siloed"³ collection of energy performance data is slowing down renovation rates, which at 0.2 to 0.3 percent across the EU,⁴ is well below the 2 to 3 percent rate required to reach the European Commission's goal of improving energy efficiency by 32.5 percent by 2030.

Historically, there have been persistent doubts whether energy-based renovations are financially worthwhile, despite a growing body of evidence that the benefits outweigh the cost. Recently though, due to the energy crisis triggered by the Russian invasion of Ukraine, there has been an increase in the demand for non-fossil fuel-based heating systems and lower energy cost. As the total occupancy cost gap between lower and higher energy performance buildings widens, tenant pressures have heightened. This is particularly the case for office buildings.

Still, when energy-related renovations are carried out, they are most commonly a by-product of non-energy focused renovations. This indicates that for many building owners and investors, energy efficiency is not the trigger to invest.⁵

A significant barrier to change is the industry's fragmented and siloed collection of data around the management of buildings, including their energy performance, and the associated financial outcomes. Doubts around the business case for energy efficiency renovations have persisted due to a lack of statistically significant evidence.

Another barrier to the acceleration of renovation rates is the so-called split incentive problem. Owners and managers are responsible for carrying out renovations. However, they do not usually reap the financial benefits of lower energy bills, which are paid by the tenants. Tenants, on the other hand, may be averse to sharing their energy performance data due to cautious tenancy relationships. The problem of landlord and tenant relationships is addressed in the *C Change Intervention #2 Tenant and Landlord Alignment*.

A lack of data, and associated uncertainties around net financial cost or benefit, are the main barriers to undertaking energy efficiency renovations. Energy efficient renovations are usually more costly than less efficient solutions, while reliable energy efficiency performance data is not widely

available for consumers, businesses or financial institutions.⁶ However, with more evidence forthcoming about the financial benefits of such renovations, the cost barrier could be overcome.

Pockets of good evidence already exist around the financial benefits of energy-related renovations.⁷ As increasing data becomes available, the case for these renovations as a trigger for investment is becoming stronger. In May 2022, a report from the Energy Efficiency Financial Institutions Group (EEFIG) pointed to a strong and statistically significant correlation between energy efficiency and credit risk.⁸ In effect, loans used for energy efficiency improvements, or new builds with a high energy performance, are less likely to default than those on low energy efficient properties.

These results build on research by the European Commission's Joint Research Centre (JRC), which suggests that energy efficiency improvements could lead to increases of 3 to 8 percent in sales price and 3 to 5 percent in rents for residential assets, as well as a 10 percent increase in sales price and 2 to 5 percent in rent for commercial property.⁹

From a lender's perspective, it is clear that mortgage lenders could also play a greater role in financing the renovation of Europe's building stock due to the volume of debt capital they deploy – around €6.64 trillion in 2021, which equates to 46 percent of the EU's GDP.¹⁰

Though the research around credit risk, rents and values is encouraging, more robust analysis of different building types and locations is required. This is only possible if energy efficiency data of buildings is collected on a large scale. Currently, there are major challenges around the measurement and sharing of such data.

Energy performance in the EU is currently measured through EPCs, which cover energy performance, use of renewables and energy costs. At a policy level, EPCs are crucial for identifying the worst-performing buildings as well as potential for improvement.¹¹

However, their effectiveness in accelerating renovations across Europe has been limited. EPCs are only issued if a building is newly constructed, rented to a new tenant, or sold. In all other cases

they are voluntary, which means that owner-occupied buildings may not be surveyed and rated. Some EU countries have less than 10 percent EPC coverage.¹²

EPCs are usually based on building models rather than energy audits, which means that a building's EPC grade and actual energy performance can diverge significantly, especially for large buildings. Additionally, EPCs do not reflect interconnectivity and smart readiness of buildings.¹³ Neither grid integration of energy producing buildings nor smart energy optimisation technology are accounted for in the certification.

Some real estate data is commercially sensitive or personal. There are nonetheless datasets, such as building information modelling (BIM) material and operational performance data that could and should be made more accessible¹⁴ to building managers, investors, financiers and retrofit providers through secure data sharing mechanisms (e.g. IceBreaker One below). At present, much of the data is unstructured, unmanaged and in various formats, or stored in closed datasets.¹⁵

Further problems arise from a lack of smart building management tools and from IT packages not being integrated in planning processes for new builds and retrofits.

All these problems make data collection a laborious process. Inevitably coverage is patchy. Property owners are left without adequate comparable data to build the case for their own energy efficiency investments, ultimately slowing down the decarbonisation of the built environment as a whole.

What is being done

The recently revised Energy Performance of Buildings Directive (EPBD)¹⁶ addresses some of the shortcomings of EPCs to enable them to be a more effective measurement tool. The plan is to incorporate this expanded EPC into digital building logbooks, building renovation passports (see *C Change Intervention #5 Building Renovation Passports*), smart readiness indicators and life cycle assessments (LCAs).

As a way of extending coverage, EPCs will be required for buildings "undergoing major

renovation, buildings for which a rental contract is renewed and all public buildings".¹⁷ EPCs rated lower than C will have a maximum validity of five years, down from the current 10-year period.

To make EPCs across the EU more comparable, they will include energy performance expressed by a numeric indicator of kWh/(m²*year) as well as the customary ratings by letter. The top rating of A will signify a zero-emission building and the following letters will reflect an even spread of standards down to G, which will be assigned to the worst performing buildings.

Member states will ensure the quality, reliability and affordability of EPCs. The content of EPCs will be expanded to include recommendations for cost-effective improvements and the reduction of operational greenhouse gases.

The pan-European deployment of smart meters is aiding the digitalisation of the utilities sector and therefore improving the measurement of energy efficiency. Smart meters measure the electricity (and often also gas) consumption of individual households and businesses. As a result, they give consumers more control over their power usage but also record and share data, and so can help shape a new energy infrastructure. In 2014, the EU announced the ambitious target of fitting 80 percent of homes with smart meters by 2020. Progress is inconsistent,¹⁸ but it is expected that, by 2024, 77 percent of European households will have a smart meter for electricity.¹⁹

Icebreaker One, a not-for-profit environmental services group, is working with companies and institutions on the Standard for Environment, Risk and Insurance (SERI).²⁰ The goal is to build infrastructure for shared data,²¹ accelerating the transition to a green economy. Part of the initiative includes a Climate-Ready Building Passport (C-RBP)²², which brings a building's physical, environmental, financial, risk and regulatory data together in digital form through a secure data governance platform.

Other data collection initiatives include:

- The De-Risking Energy Efficiency Platform (DEEP),²³ which assesses energy efficiency investments and risks, based on investment track record. The platform covers more than 17,000

energy efficiency projects from over 30 providers. Overseen by the European Commission DG Energy, the data is kept confidential and only shown in aggregate analysis.

- The Energy Efficiency Mortgage Initiative (EEMI)²⁴ seeks to introduce a greener, more sustainable means of buying, renovating and living in Europe.
- The BuiltHub²⁵ project is developing a data exchange platform that aims to provide stakeholders with the knowledge needed to make more sustainable building and renovation policies, programmes and financing schemes.

Possible next steps

To overcome the fragmented and siloed collection of data in real estate, better collaboration between many value chain links – including tenants, landlords, financiers, retrofit providers, data analysts and policy makers – is needed to support industry data-sharing initiatives. Ideally, providing data becomes mandatory or standard best practice.

Until then, the collection of energy efficiency data must become routine. This involves fitting smart meters and issuing EPCs for all commercial and residential buildings.

At the same time, as EEFIG suggests, the financial case for energy efficient retrofits would become clearer if the EU regulatory framework made it mandatory for banks to use energy performance as part of their property lending criteria²⁶.

As EEFIG puts it, "the robust evidence of a tentative correlation between energy efficiency and property value being continuously discovered, energy efficiency may as well start to feature" in assessments of credit risk.²⁷

How to get involved

Icebreaker One is looking for [supporters](#) to help unlock net-zero data from several sectors, including real estate.

Register as a [data provider](#) for your energy efficiency renovation investments on the De-risking Energy Efficiency Platform.

Join the [BuiltHub community](#), contribute your data and become one of the first users of the platform upon its release at the end of 2022.

Lenders can engage with the EEMI and develop the business case for green mortgages through the [EEM label](#).

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 [Call for action: Seizing the decarbonization opportunity in construction](#)
- 2 p.5 [Literature review of the energy efficiency gap](#)
- 3 [Climate-Ready Building Passport – an Instrument to Catalyse Net-Zero Insurance > Icebreaker One](#)
- 4 p.2 [Energy efficiency and building policies in the EU and US](#)
- 5 p.39 [A guidebook to European Building Policy](#)
- 6 p.11 [Literature review of the energy efficiency gap](#)
- 7 [Making the business case – EEMI](#)
- 8 [New report: Final Report on Risk Assessment](#)
- 9 p.3 [Energy efficiency, the value of buildings and the payment default risk](#)
- 10 [Energy Efficient Mortgages Initiative](#)
- 11 [EU Commission: A Renovation Wave for Europe - greening our buildings, creating jobs, improving lives](#)
- 12 [Ibid](#)
- 13 [Ibid](#)
- 14 p.3 [Exploring new approaches for sharing data in the built environment](#)
- 15 [Climate-Ready Building Passport – an Instrument to Catalyse Net-Zero Insurance > Icebreaker One](#)
- 16 p.64 [EU Commission: Directive of the European Parliament and of the Council on the energy performance of buildings \(recast\)](#)
- 17 p.66 [Ibid](#)
- 18 [Tripeca: Smart meter deployment in the EU: which countries are leading and which are trailing?](#)
- 19 [Smart grids and meters](#)
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- 24 [Energy Efficient Mortgages Initiative](#)
- 25 [BuiltHub](#)
- 26 p.16 [Publications Office of the EU: The quantitative relationship between energy efficiency improvements and lower probability of default of associated loans and increased value of the underlying assets](#)
- 27 p.16 [Ibid](#)

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