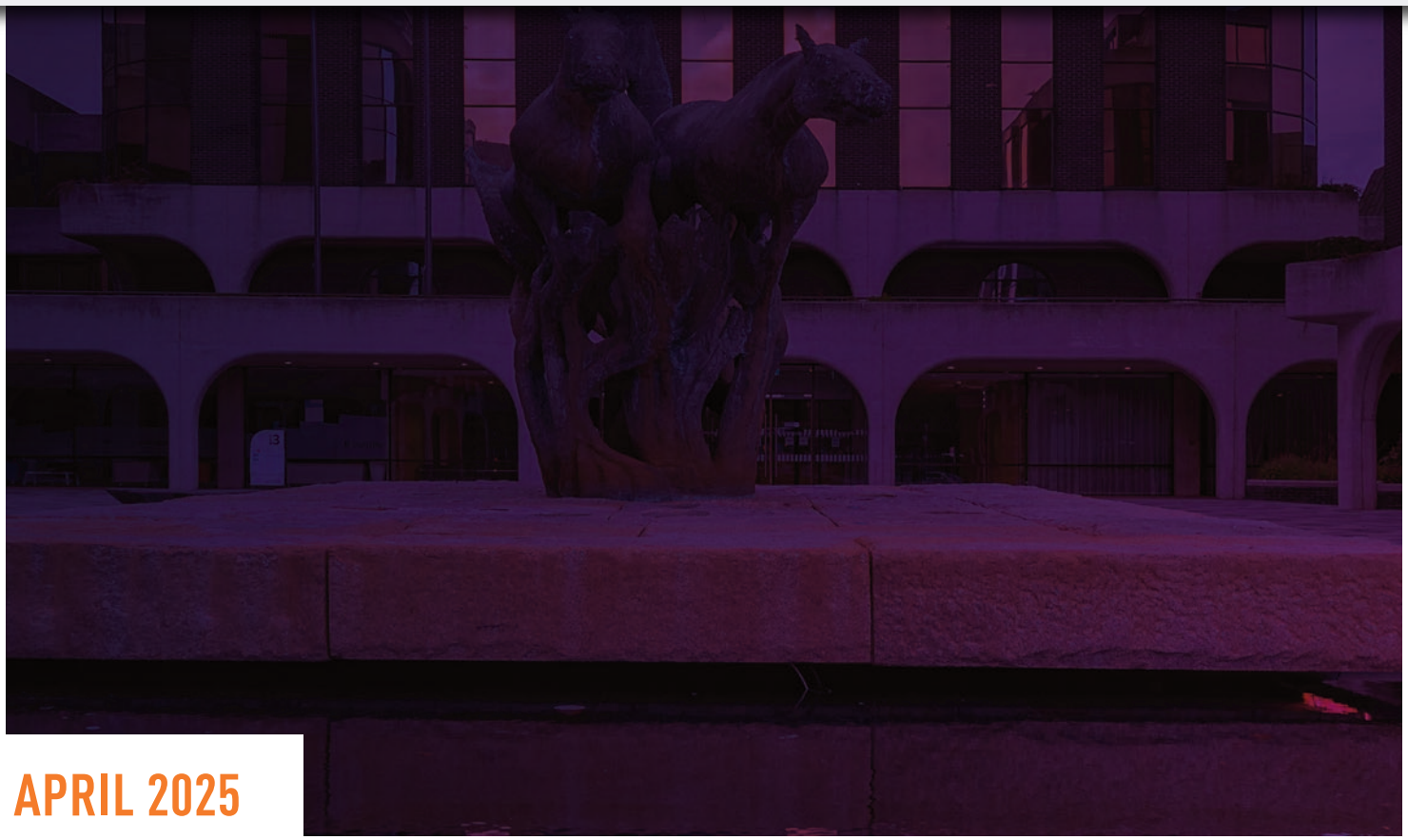
SCSI Chartered property, land and construction surveyors

AIB

REAL COST OF RETROFITTING

Analysis of office block retrofit costs and viability



APRIL 2025

REAL COST OF RETROFITTING

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FOREWORD FROM THE SCSI

The transition to a more sustainable built environment is no longer an aspiration – it is an urgent necessity. Across Europe, the ESG mandate is setting clear targets that demand meaningful action.

In Ireland, the commercial property sector is at a crossroads, facing the dual challenge of meeting these ambitious sustainability requirements while ensuring economic viability.

As an organisation that acts in the public interest, this SCSI report is yet another example of how the collective knowledge and expertise of surveyors can help shine a light on the current status of retrofitting and provide tangible solutions to help meet national objectives.

This report provides a comprehensive examination of the cost and feasibility of retrofitting commercial office buildings in Ireland. It highlights the critical role that retrofitting will play in achieving ESG targets, reducing carbon footprints, and ensuring that Ireland's commercial stock remains fit for purpose in an evolving market.

SCSI members, including quantity surveyors, building surveyors, conservation surveyors and valuation/commercial surveyors, have been at the forefront of this conversation, bringing invaluable insight to both the financial and technical challenges of retrofitting. The findings in this report serve as a vital resource for policymakers, investors, and industry professionals as we work collectively to navigate this transition. While the road ahead is complex and our report evidences some viability challenges, it also highlights the significant opportunity that retrofit provides in terms of enhanced values, improved working spaces for tenants, and the positive impact on the built environment through minimising the risk of obsolescence and dereliction. With the right strategies in place, Ireland can lead the way in transforming its commercial stock into a more sustainable, efficient, and resilient asset class. We are delighted to be supported by AIB on this report, bringing together the key surveying professionals and finance expertise to contribute data-led insights to the important national dialogue on commercial property retrofitting. We also thank Enda McGuane FSCSI FRICS, SCSI Past President, and Chairperson of the research committee overseeing this report, and the committee members, for their work.

Kevin Hollingsworth FSCSI FRICS

SCSI President

FOREWORD FROM AIB

Sustainability is central to the AIB Group strategy. AIB seeks to empower people to build a sustainable future by reducing our own carbon footprint and supporting our 3.35 million customers so we can all be better protected against the impacts of climate change.

As a bank at the heart of the Irish economy, AIB supports our customers in the creation and delivery of sustainable economic, social and environmental development in towns and communities across the country.

Our ambition is that 70% of AIB's new lending will be green or transition by 2030. We are making real progress towards achieving that goal through the deployment of our €30 billion Climate Action Fund.

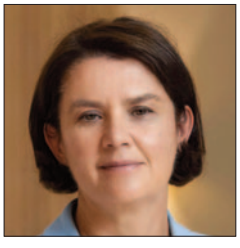
The UN has estimated that nearly 40% of global carbon dioxide emissions come from real estate. Therefore, improving the energy performance of property is critical to achieving our national net zero ambitions. However, making a building healthier and more efficient can also add significant value and viability to a property, while mitigating against business and climate risks.

Retrofitting existing buildings reduces the whole-life carbon of a structure by not adding to the carbon already embodied in the existing property. It typically involves a collaborative approach with tenants to phase the works over time, using bank funding on the property itself. This is a complex process, requiring engagement with property professionals and your funder.

Undertaking a retrofitting project represents a significant investment by the property owner and needs to be considered from many perspectives, including financial viability. In that regard, one key data point that has been lacking is a firmer and more data-based analysis of the costs to undertake the work. In many cases, this lack of clarity has underpinned inaction.

AIB is excited to support the SCSI in the production of this report. We believe that this is an essential first step for everyone in the Irish property market to understand both the importance of and the challenges associated with retrofitting commercial office blocks in Ireland. We hope that it will help lead to greater adoption of this essential aspect of Ireland's decarbonisation journey.

AIB encourages all our customers to improve the energy efficiency of their properties and will continue to work collaboratively with them to help achieve this, underpinned by our strong commitment to greening our lending book.



Cathy Bryce
AIB, Capital Markets

ABOUT THE SCSI

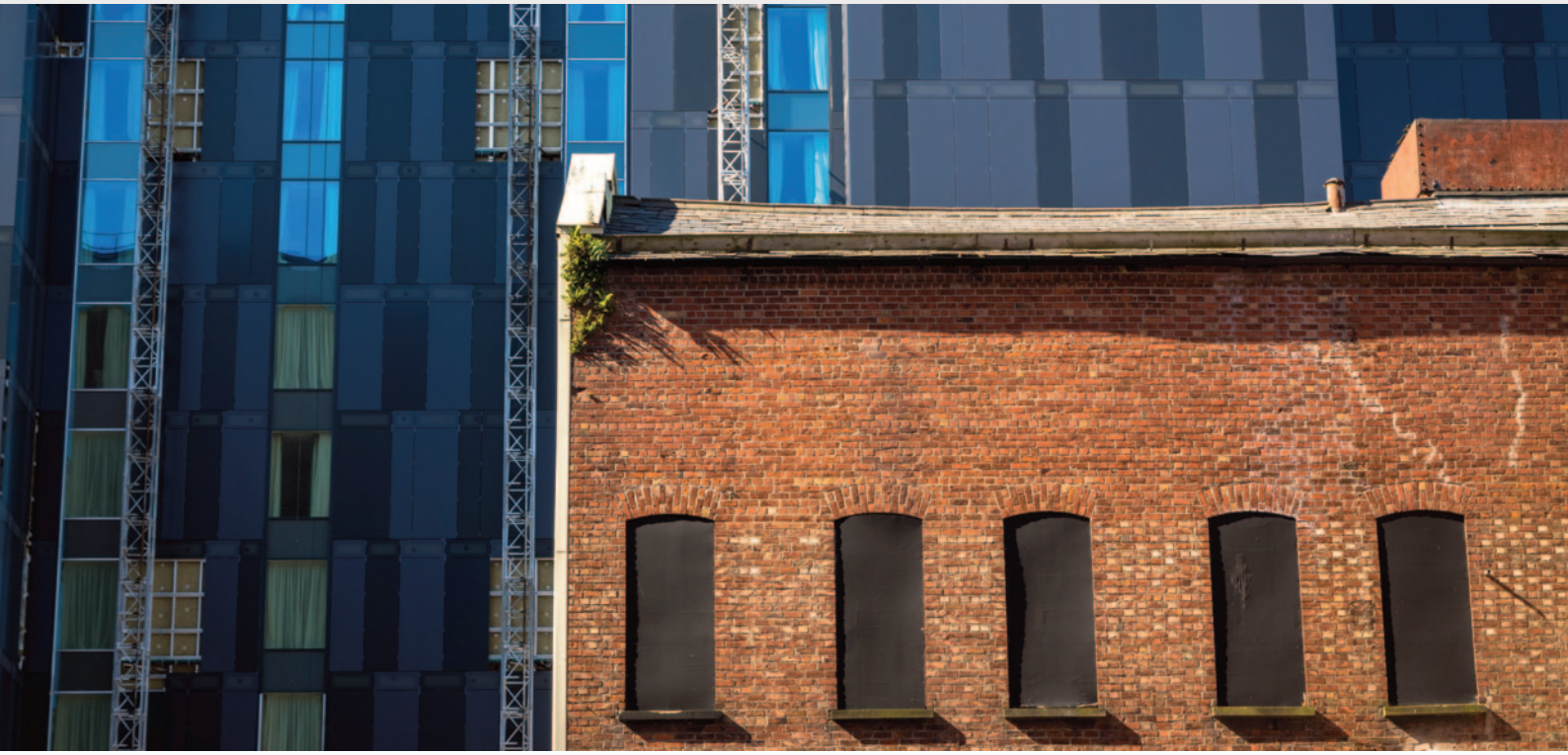
The Society of Chartered Surveyors Ireland (SCSI) is the independent professional body for Chartered Surveyors working and practising in Ireland. One of our key objectives is to provide impartial, independent and data driven advice on key issues for consumers, business and policymakers.

We are also active in advancing and maintaining standards for Chartered Surveyors working in the property, construction and land sectors.

All aspects of the profession, from education through to qualification and the continuing maintenance of the highest professional standards are regulated and overseen through the partnership of the Society of Chartered Surveyors Ireland and Royal Institution of Chartered Surveyors, in the public interest.

ABBREVIATIONS USED IN THIS REPORT

Acronym	Definition
SCSI	Society of Chartered Surveyors Ireland
AIB	Allied Irish Bank
EPBD	Energy Performance of Buildings Directive
BER	Building Energy Rating
LEED	Leadership in Energy and Environmental Design
CSRD	Corporate Sustainability Reporting Directive
EPC	Energy Performance Certificates
MEPS	Minimum Energy Performance Standards
ESG	Environmental Social Governance
CSO	Central Statistics Office
M&E	Mechanical and Electrical
HVAC	Heating, Ventilation and Air Conditioning
ICMS	International Construction Management Standards
IPMS	International Property Measurement Standards
OGP	Office of Government Procurement
BIM	Building Information Modelling
DEC	Display Energy Certificates
BEUS	Business Energy Upgrade Scheme



EXECUTIVE SUMMARY

The SCSI has undertaken this comprehensive analysis to provide impartial insights into the real costs and financial viability of retrofitting commercial office blocks in Ireland.

This research aims to take the first steps in identifying crucial cost data and improving the understanding of the works required to achieve a more energy-efficient and decarbonised building stock by 2050, in line with revised EU legislation.

The research highlights a significant disparity between the progress in residential and commercial retrofitting. While the residential sector is responding more positively to energy upgrade targets, the commercial sector lags considerably, with a low percentage of older buildings achieving satisfactory Building Energy Ratings (BERs).

The current BER standards are used to quantify the energy performance of a building on a scale from A (best energy performance) to G (worst energy performance). This study, therefore, is a vital step in understanding the financial realities of upgrading commercial assets, particularly offices.

To conduct this analysis, an expert group of Chartered Surveyors developed a robust methodology involving the collection and evaluation of seven diverse commercial retrofit case studies from our membership. These case studies encompassed a range of office types, ages, and conditions. This analysis primarily focuses on 'hard costs', which are the direct expenses related to the physical work of the retrofit itself.

These costs typically cover works such as the partial demolition of existing structures, structural repairs, upgrades to the building's exterior (walls and roofs), internal finishes, and the installation and upgrading of mechanical and electrical (M&E) services such as lighting, heating, and ventilation. The hard costs in this study are based on achieving a Category A (CAT A) fit-out, which is a basic level of interior finishing suitable for commercial tenants. The costs presented exclude 'soft costs' such as site costs, contingency funds, professional fees, cost of finance, local authority fees and VAT.

To assess the financial implications, a panel of Chartered Valuation Surveyors evaluated the pre- and post-retrofit estimated values, rental incomes, and expected net yields under the assumption of vacant possession. For this report, net yield is used to assess the attractiveness of

Net Effect

The 'Net Effect', representing the percentage of retrofit costs relative to the change in estimated value, was used to gauge financial viability. If the Net Effect is positive, it suggests that the increase in the property's estimated value after the retrofit is greater than the cost of the retrofit, relative to the post-retrofit value, i.e., the retrofit not only pays for itself in terms of increased value, but also contributes to a positive financial gain when considering the property's value after the retrofits. If the Net Effect is negative, it indicates that the cost of the retrofit outweighs the increase in the property's estimated value, when considered as a percentage of the property's value after the retrofit. This suggests that, based purely on the change in estimated value, the project did not meet our defined viability hurdle.

an investment. This is often used in conjunction with other valuation metrics to determine an asset's value.

The case studies were subject to detailed cost reviews by Chartered Quantity Surveyors and these reviews ensured the quality of the data, to ensure that the analysis was focussed on retrofitting costs only and removed any 'value engineering' aspects of the works, e.g., extensions, additional floors.

These value-added aspects of a retrofit are fundamental to ensuring that a retrofitted property can attract the highest possible market return for its

Net yield

Net yield in this context refers to the income return on value (i.e., estimated rent divided by estimated value adjusted for purchase costs). A lower yield is viewed as a more secure investment, with the property value set to increase as rents grow. Overall returns in this scenario would be expected to be greater than a property that experiences a yield moving out (e.g., net yield moving from 5% to 7%).

investment. Value-added pieces could significantly improve the potential estimated value of the property in the future, as well as mitigating risks associated with the obsolescence of office properties in the face of a changing landscape with regard to the Corporate Sustainability Reporting Directive (CSRD). As a result, if this research identifies a case study as not reaching the financial viability hurdle, that does not mean that it is financially unviable for retrofitting, but merely that the specific cost of retrofitting the existing structure and floorplate is not financially viable and wider measures would need to be considered to ensure that the financial return is improved.

Importantly, the use of financial results in terms of valuations is specifically focused on properties with the assumption of vacant possession. This means that access to different funding pathways, such as using tenant-generated revenue or grants that are specific to certain elements of the retrofit, are not included.

REAL COST OF RETROFITTING

Table 1: Summary of buildings included in case studies.

Case study ID	Age	BER change	Size (gross floor area – approximate)	Condition	Location	SCSI valuation hurdle
Case Study 1	60 years	Not available -B2	9,000m²	Fair condition	Dublin 2	Retrofitting financial viability hurdle not met
Case Study 2	20 years	D-A3	18,000m²	Good condition	Dublin 1	Retrofitting financial viability hurdle not met
Case Study 3	25 years	D2-A3	12,000m²	Fair condition	Dublin 1	Retrofitting financial viability hurdle met
Case Study 4	25 years	C2-B2	11,000m²	Good condition	Dublin 2	Retrofitting financial viability hurdle met
Case Study 5	35 years	E1-B2	5,400m²	Good condition	Dublin, Glasnevin	Retrofitting financial viability hurdle met
Case Study 6	40 years	D-B	4,000m²	Poor condition	Dublin, Blackrock	Retrofitting financial viability hurdle not met
Case Study 7	20 years	E1-C1	12,000m²	Good condition	Dublin 2	Retrofitting financial viability hurdle not met

The examination of the seven case studies revealed substantial variations in retrofitting costs, largely influenced by the specific characteristics of each office block and the extent of upgrade works (**Table 1**).

Offices in good condition

For offices in good condition and aged between 20 and 35 years, the costs of retrofit spanned between €225/m² and €1,814/m² (Case Studies 2, 4, 5 and 7). The BER of these properties ranged from E1 to C2 (rated before the retrofit), with offices reaching a minimum of C1 after the retrofits, and up to A3.

- Services, encompassing M&E upgrades, often represented the most significant cost component. The proportion of these costs ranged between 21% and 76%.
- According to the Chartered Valuation Surveyors, estimated value could change by between 5% and 122% across these properties (based on estimated value before and after the retrofit), while rental income could increase by between 40% and 66% (based on rental income estimates before and after the retrofits). One case study was identified as having no change in rental income based on the scope of works. Two properties in this grouping were identified as financially viable, with two classified as unviable. The net effect was between -23% (Case Study 2) and -15% (Case Study 7) for those that did not meet the viability hurdle. Both Case Study 4 and Case Study 5 were shown to have a positive Net Effect of 27% and 34%, respectively.

Offices in fair condition

Offices in fair condition, and aged between 25 and 60 years, showed retrofitting costs from approximately €917/m² to €1,154/m² (Case Study 1 and Case Study 3). The BER of these properties following the retrofit reached a B2 rating and an A3 rating, respectively.

- The analysis highlights efforts made by the respective case studies to improve the BER, with Case Study 1 achieving a BER of B2 and Case Study 3 achieving an A3 rating. Both invested heavily in core energy upgrades, including lighting. However, Case Study 3 invested more in smart control systems and building management services, which would

have helped to reach a higher BER than Case Study 1. This higher BER would likely allow Case Study 3 to attract better tenants, especially in a prime Dublin 2 location.

- The analysis suggests potential economies of scale for larger properties when considering cost per square metre. While services remained a key cost factor, upgrades to the external enclosures also played a crucial role in achieving the enhanced BER rating in some cases. In terms of financial viability, Chartered Valuation Surveyors identified a change in estimated value of between 52% and 73%, with rental income also suggested to improve by between 50% and 60%.

  Like the offices in good condition, the two case studies here showed different results in terms of meeting the viability hurdle. Case Study 1 showed a Net Effect of -14%, therefore not meeting the hurdle. Case Study 3 showed a net effect of +3.6% and therefore did meet the hurdle. This is mainly driven by the costs of retrofitting for each property. In Case Study 1 the change in estimated value would not cover the costs of the retrofit, whereas in Case Study 3 the projected change in estimated value would cover the costs of the retrofit.

Office in poor condition

The office in poor condition, a 40-year-old building in Blackrock, incurred a cost of €1,462/m^2 (Case Study 6), the second highest among the case studies. This office was D1 rated before the retrofit and reached a B rating following works.

- The condition of the office was highlighted in the elevated prices for the external enclosure, services, and internal finishes required to meet a CAT A specification. Services accounted for approximately 38% of the overall costs, while internal finishes and completions accounted for approximately 23% of the overall costs.
- The valuation exercise completed anticipated the estimated value to increase by 61%, while the rental value would increase by 19%, and the net yield would change positively by 1.5%. Despite these positive metrics, the improvement in estimated value because of the retrofit resulted in a Net Effect of -73% and therefore was deemed not viable.

This research highlights the complex relationship between commercial retrofitting costs and property valuations, emphasising significant cost variations across different upgrade approaches. While services and internal finishes represent major cost components, retrofitting projects also show clear improvements in yields, estimated values, and rental values.

Retrofitting commercial spaces is fundamental for Ireland to achieve its climate goals, as the worst performing buildings face increasing legislative pressures combined with market demand for more sustainable buildings, increasing the risk of potential obsolescence. Retrofitting can reduce the risk of obsolescence, but a holistic approach to the building is essential. These works need to prioritise the thermal efficiency of the building, over asset replacement, to future-proof the building against evolving standards and demands.

INTRODUCTION

Ireland's building stock will need to have an improved level of energy efficiency and be largely decarbonised by 2050.

The introduction of revised EU legislation (the EU Energy Performance of Buildings Directive (EPBD) and the EU Energy Efficiency Directive)[1] imposes higher standards on older commercial building stock, such as offices.

The EPBD is aimed at reducing the energy consumption and greenhouse gas emissions of buildings. The EPBD sets out a pathway to achieve a zero-emission building stock for member states by 2050 by significantly reducing the energy demand of buildings and shifting to sources of renewable energy.

The EPBD strengthens the role of Energy Performance Certificates (EPCs) to help provide clear information on a building's energy performance, while encouraging deep renovations of existing buildings, particularly the worst performing ones. Commercial properties, including offices, will have to comply with the requirements of the EPBD. Failing to meet these standards increases the risk of obsolescence.

Minimum Energy Performance Standards (MEPS) for the worst performing non-residential properties have been set under the EPBD. By 2030, it will be a requirement that 16% of Ireland's worst performing buildings meet MEPS, and 26% by 2033. These MEPS, and how they are measured and enforced, will be defined by each country. The residential sector continues to deliver positive responses to the targets outlined in national and international legislation, with over 54,000 homes currently upgraded to date, including 12,000 to a minimum Building Energy Rating (BER) of B2 or cost-optimal equivalent.[2] Commercial retrofitting has yet to see the same growth, with the latest Central Statistics Office (CSO) data indicating that only 27% of buildings built between 1900 and 1977 have a BER of at least B or higher. To reach the designated targets identified under Ireland's Long Term Renovation Strategy and the current 2024 Climate Action Plan, renovation of existing commercial building stock is required. The built environment accounts for approximately 37% of our emissions and is ranked as important as transport and agriculture in terms of reducing these emissions. It is estimated that there are approximately 124,000 buildings in the commercial sector in Ireland, with approximately 71% currently being used exclusively for commercial purposes. Given the ambitious targets to retrofit our built environment, Ireland and other EU countries run the risk of incurring severe penalties in the future if they fail to meet targets, with fines ranging from €8bn to €26bn.[3]

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1 European Union. Energy Efficiency Directive revised, 2023. Available from: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=OJ%3AJOL_2023_231_R_0001&qid=1695186598766.

2 Sustainable Energy Authority of Ireland. National Retrofit Plan Quarterly Report, 2023. Available from: https://www.seai.ie/sites/default/files/publications/SEAI-Retrofit-Quarterly-Report-Q3-2023.pdf.

3 *The Irish Times*. Inside Politics Podcast. Available from: https://www.irishtimes.com/podcasts/inside-politics/will-falling-behind-on-climate-cost-ireland-billions/.

BACKGROUND

The commercial real estate market in Europe and Ireland is navigating through a landscape marked with optimism despite geopolitical tensions and uneven economic growth.

The office market is undergoing a significant shift towards sustainable properties with enhanced end-of-life facilities, driven by the need to attract workers back to the office. This section provides an overview of the global, European and Irish commercial office market.

Global market overview

- **Investment**: The RICS Global Commercial Monitor[4] net balance index showed a slight improvement in sentiment regarding investment enquiries from +3% in Q3 2024 to +4% in Q4 2024. On a country-by-country basis, the USA showed a large rise in sentiment regarding investment enquires, rising to +38% in Q4 2024 (+18% and +9% in Q3 and Q2 of 2024, respectively). Europe also saw a slight rise, from +1% in Q3 2024 to +3% in Q4 2024.
- **Prime offices:** The RICS Global Commercial Monitor[4] identifies that on a global level, estimated values for prime offices are expected to see a limited rise over the next year – for the first time since Q2 2022. Sentiment in Europe regarding projections for rents for prime offices and industrial assets is anticipated to see a modest rise over the year. The sentiment is still firmly negative regarding the secondary office markets in both the USA and Canada, but projected prime industrial and retail values are expected to rise over the coming 12 months.

European market overview

- **Investment and development prospects**: According to the Emerging Trends in Real Estate, Europe 2025 report by PwC and the Urban Land Institute,[5] Dublin ranks 17th among 30 European cities for investment and development, down from 13th the previous year. Interviewees referenced infrastructure deficits and the complexity of the planning system as important factors. This shift reflects broader market adjustment amid global challenges.
- **Environmental, social, and governance (ESG) challenges:** Over 70% of respondents in the same report[5] expressed concerns about environmental issues in 2025, with 72% viewing these as significant over the next five years. This suggests that ESG considerations are increasingly pivotal in shaping investment strategies and property developments.

Irish market focus

- **Rental and capital trends:** In the SCSI's Commercial Market Monitor, 45% of Chartered Surveyors expected that the capital values of prime offices would increase, while 38% expected them to remain the same, and 19% expected a decrease. Some 46% of Chartered Surveyors felt that rent for prime offices would increase, and 39% expected it to stay

[4] RICS. Global Commercial Property Monitor Q4, 2024. Available from: https://www.rics.org/news-insights/market-surveys/global-commercial-property-monitors.
[5] PwC and Urban Land Institute. Emerging Trends in Real Estate Europe 2025. 2024. Available from: https://www.pwc.com/gx/en/industries/financial-services/real-estate/emerging-trends-real-estate/europe.html.

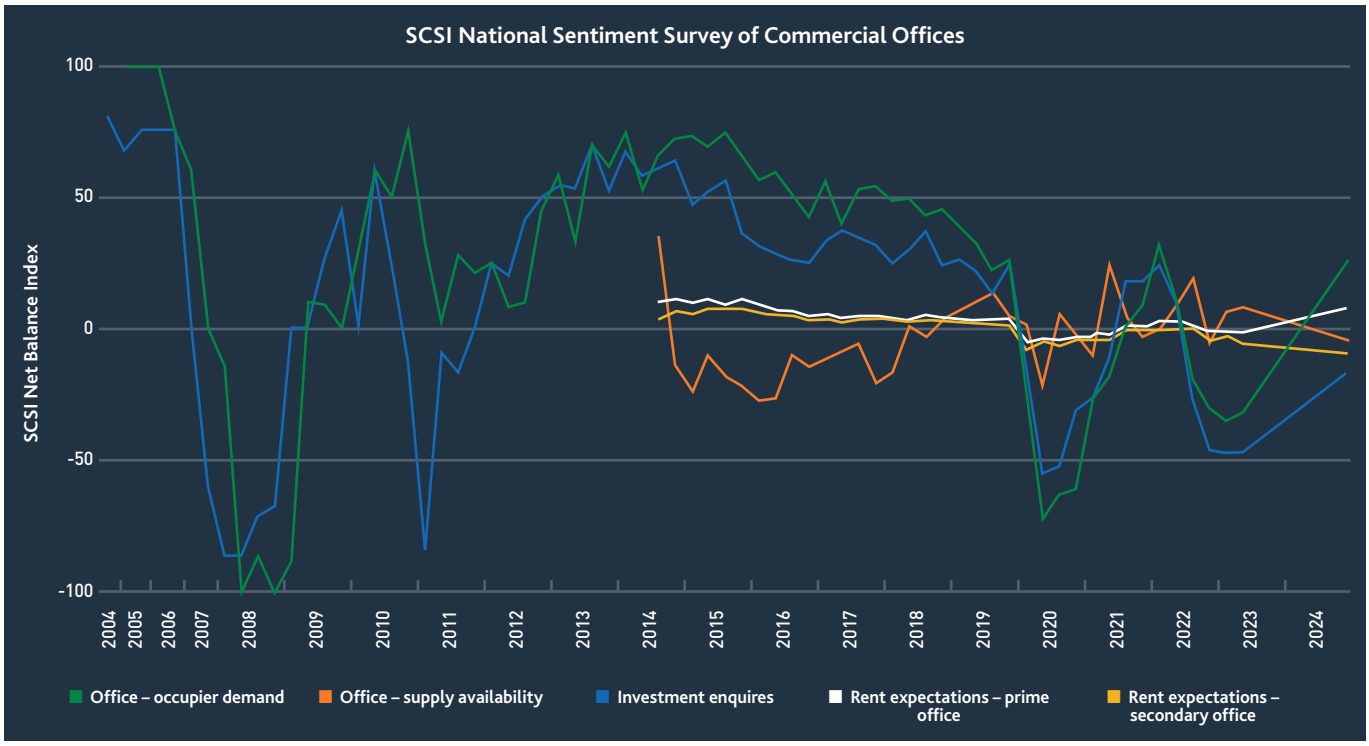


FIGURE 1: SCSI net balance National Sentiment Survey of Commercial Offices. *Source: SCSI/RICS research.*
Note: Net balance = proportion of respondents reporting a rise in a variable minus those reporting a fall (if 30% reported a rise and 5% reported a fall, the net balance would be 25%). Net balance can range from -100 to +100.

the same, with 17% anticipating that rents will decrease. This sentiment towards increasing office rents is supported by JLL's Dublin Market Dynamics, Q4 2024 report, which projects rents to increase to €70/sq. ft for Grade A+ buildings in prime locations.[6] Regarding secondary offices, 82% of surveyors expected the capital values to remain the same or decrease, while 81% anticipate that rental prices will also stay the same or decrease. The SCSI's Commercial Market Monitor identified an overall positive sentiment regarding national commercial rental expectations, indicating a potential stabilisation in the market.[7]

- **Investment volume:** The SCSI's Commercial Market Monitor identified an increase in investment sentiment across the three sectors considered in the commercial space (office, industrial and retail). The office sector has seen a significant rise in investment sentiment, increasing from a -52% sentiment score to a -7% sentiment score between Q4 2023 and Q4 2024.[8] Cushman & Wakefield's Investment Market Report (Q4 2024) highlights the improvement in the office sector, with investments totalling approximately €249 million, which was the strongest since Q2 2022.
- **Occupancy and demand for offices:** The SCSI Commercial Market Monitor National Occupier Sentiment Index shows a net balance of +17% for occupier demand in Q4 2024 (up from -4% in Q4 of 2023) (**Figure 1**). The office sector showed a significant occupier demand sentiment increase, with the National Occupier Sentiment Index showing the net balance increasing to +15% (from -32% in Q3 2023). This has mainly been driven by higher levels of interest from occupiers and lower levels of oversupply stock. The proportion of Chartered Surveyors who reported an increase in inducements fell from 50% in Q4 2023 to 39% in Q4 2024, while those reporting a decrease rose from 2% to 7%. Savills data[9] indicates a marginal increase in office occupancy from 59% to 60% from the first to the second half of 2024, with Dublin's rates climbing from about 52% to 54%.
- **Leasing and availability:** Cushman & Wakefield's Q4 2024 Office Market report[10] records a take-up of 49,700m^2, with total take-up for the year at approximately 201,000m^2, an increase of approximately 40% from 2023. Gross availability in Dublin was largely unchanged, at 16.5%. CBRE's Q4 2024 report[11] sees annual take-up of Dublin office space increasing by 66% from 2023.

6 JLL. Dublin Office Market Dynamics, Q4 2024, 2025. Available from www.jll.ie.
7 SCSI Commercial Property Market Monitor Review and Outlook 2025. Available from: https://scsi.ie.
8 SCSI Commercial Property Market Monitor Review and Outlook 2025. Available from: https://scsi.ie.
9 Savills, European Office Occupancy Rates, 2024. Available from: https://www.savills.ie/research_articles/247607/370831-0#:~:text=In%202024%2C%20average%20weekly%20European,around%20this%20level%20moving%20forward.
10 Cushman & Wakefield, MarketBeat Ireland: Dublin Office Market Q4, 2024. Available from: https://www.cushmanwakefield.com/en/ireland/insights/dublin-marketbeat.
11 CBRE, Dublin Office Market Q4 2024, 2025. Available from: https://www.cbre.ie/insights/.

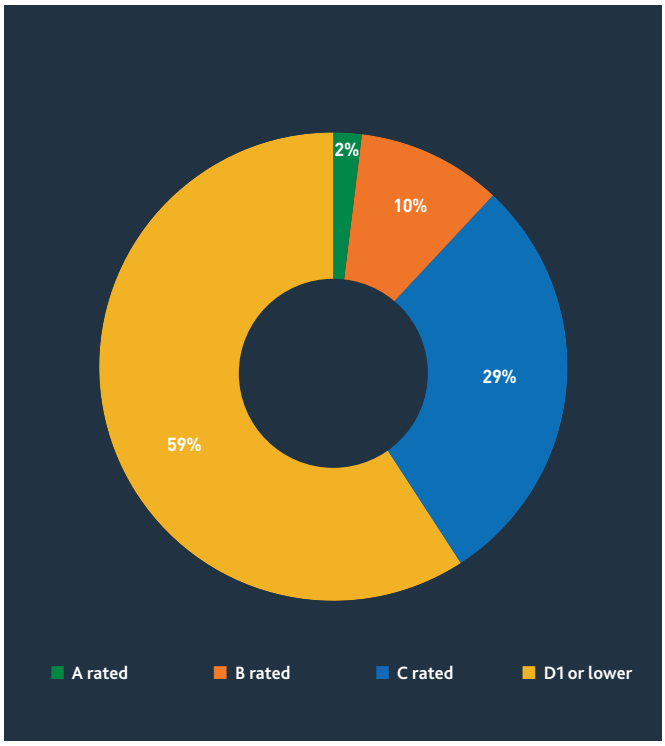


FIGURE 2: Non-domestic Building Energy Ratings. Source: CSO, 2024.[17]

- **Growing demand for sustainability:** The SCSI Commercial Market Monitor[7] also highlights a significant shift in the commercial real estate market in terms of sustainability, with 54% of surveyors noting increased demand from occupiers and 42% from investors. Notably, there is a growing emphasis on retrofitting, with 71% of surveyors expecting demand to rise. The survey also reveals that 92% of surveyors anticipate growing tenant demand in terms of health and well-being from their buildings. This reflects the industry's focus on sustainability, particularly in the context of the 'S' in ESG, which underscore the importance of social considerations.

Commercial vacancies in Ireland

- **National overview**: EY's Q4 2024 report[12] on commercial vacancies, in collaboration with GeoDirectory, notes 30,365 vacant commercial units, equating to a 14.5% national vacancy rate, the highest level reported since 2013.
- **Dublin's commercial scene**: In Dublin, the commercial vacancy rate increased by 0.5% from Q4 2023, which is the highest level recorded in Dublin since Q4 2016, according to EY.[13] CBRE's Dublin Office Market Report also identifies a vacancy rate of 18.6% for office spaces but believes this has peaked and will decline through 2025.[14]

Non-domestic Building Energy Ratings (BER)

The CSO provides insights into the energy efficiency of non-domestic buildings through the BER system, highlighting significant improvement over recent years.[15]

- **General trends:** From 2020 to 2024, out of 3,057 audits of non-domestic buildings, 42% achieved an A rating, marking a substantial improvement from the 21% A-rated buildings among the 1,674 audits conducted between 2015 and 2019.
- **Office spaces:** Among around 18,000 office units analysed by the CSO:

  - only 2% achieved an A rating;
  - 10% were rated B1 to B3;
  - 29% had ratings from C1 to C3; and,
  - A majority (59%) were rated D1 or lower (**Figure 2**).

Source: CSO,[15] *2024.*

[12] EY, GeoDirectory. Commercial Vacancy Rates Report Q4 2024, 2025. Available from: https://www.ey.com/content/dam/ey-unified-site/ey-com/en-ie/services/strategy-transactions/documents/ey-geodirectory-residential-buildings-report-q4-2024.pdf.
[13] EY, GeoDirectory. Commercial Vacancy Rates Report Q4 2024, 2025. Available from: https://www.ey.com.
[14] CBRE, Dublin Office Market Q4 2024, 2025. Available from: https://www.cbre.ie/insights/.
[15] Central Statistics Office. Non-Domestic Building Energy Ratings Quarter 4, 2024. Available from: https://www.cso.ie/en/releasesandpublications.

APPROACH AND METHODOLOGY

This research marks an initial effort to understand the financial aspects of achieving a more energy-efficient and decarbonised commercial building stock in line with revised EU legislation.

To conduct this analysis, the SCSI established an expert group of Chartered Surveyors. The Chartered Quantity Surveyors developed a costing template and reviewed the cost data from seven diverse commercial retrofit case studies provided by SCSI members. These case studies represent a variety of office types, ages, and conditions, and detailed information about these was collected during the second half of 2024 **(Table 2)**.

The study primarily focused on the 'hard costs' of retrofitting, which are the direct expenses related to the physical upgrade works. These costs included demolition (e.g., strip-out of existing mechanical and electrical (M&E) installations), structural works (e.g., roof and basement modifications), works to the external enclosures (e.g., finishes to the roof and external walls), works on internal finishes and completions (e.g.,

Net Effect

The report utilises the 'Net Effect' to gauge financial viability, which is calculated as a percentage of retrofit costs relative to the change in estimated value. A positive Net Effect suggests that the increase in estimated value after the retrofit exceeds the cost, indicating the financial viability based on this metric alone. Conversely, a negative Net Effect suggests that the retrofit costs outweigh the increase in estimated value. It is fundamental to interpret the Net Effect percentage in the context of this report as an indicator of potential viability, and not an outright claim of the viability of the project in a wider sense. Other factors, such as access to funding, revenue streams raised through in-situ tenants, and the long-term strategic benefits of the retrofit were not incorporated as metrics in determining viability in this report.

Net yield

Net yield in this context refers to the income return on value (i.e., estimated rent divided by estimated value adjusted for purchase costs). A lower yield is viewed as a more secure investment with the property value set to increase as rents grow. Overall returns in this scenario would be expected to be greater than a property that experiences a yield moving out (e.g., net yield moving from 5% to 7%).

replacement of doors, floor and ceiling finishes), and works associated with service installation (e.g., new sanitary fittings when applicable, and M&E installations). The reported hard costs are based on achieving a CAT A fit-out, a basic level of interior finishing suitable for commercial tenants. Importantly, the costs presented exclude 'soft costs' such as site costs, contingency funds, cost of finance, local authority fees, and VAT. Professional fees were also excluded from the analysis due to the significant variations in the scope of work required for different retrofit projects.

To assess the financial viability of retrofitting, a panel of Chartered Valuation Surveyors provided their expert opinions on the case study properties in Q4 of 2024. They evaluated pre- and post-retrofit estimated values, rental incomes, and expected net yields under the assumption of vacant possession. For this report, net yield is used to assess the attractiveness of an investment. This is often used in conjunction with other valuation metrics to determine an asset's value.

This research encompassed case studies with varying BER ratings before the retrofitting, and even some projects that reached the tender stage but were not completed, aiming to capture the broad spectrum of costs and potential challenges. Retrofitting costs, on a per square metre basis, were calculated based on the gross floor area, while valuations were estimated based on the net floor area.

Categories of office blocks covered in this report

Office blocks are varied throughout Ireland and therefore it was important to gather as diverse a range of information as possible to understand some of the driving cost mechanisms around the cost of retrofitting a property.

Table 2: Commercial properties – office types.

Sub-classification	Name of office type	Detailed description	Approximate time when this office was built
Office Type A	Georgian or traditional office	Traditional buildings generally include those built with solid masonry walls of brick, stone or clay, using lime-based mortars, often with a lime or earthen-based render finish, single-glazed timber or metal-framed windows, and a timber-framed roof usually clad with slate but often with tiles, copper, lead or, less commonly, corrugated iron or thatch. In general, these were the dominant forms of building construction from medieval times until the second quarter of the twentieth century.	Pre-1940s
Office Type B	First-generation office space	Basic internal finish. May have solid internal partitions to individual offices. No raised floors. Average or low ceiling heights. Smaller floor plates. Single-glazed windows. Open floor areas often have numerous pillars. May or may not have air conditioning and lifts. Exterior cladding is often precast concrete sections.	Between 1955 and 1975
Office Type C	Second-generation office space	Basic internal finish. Open plan (mainly later subdivided by semi-permanent partitions). Average ceiling heights. Adequate floor plates, pillars well spaced. May or may not have air conditioning. Typically, conventional heating systems. Lifts. May have raised floors added.	Between 1975 and 1990 (includes upgraded first-generation blocks)
Office Type D	Third-generation office space	Large open floor plates, pillars well spaced. May have ground floor atriums. Higher ceilings to accommodate raised floors. Raised floors for computer cabling. Air conditioning and lifts. Exterior cladding varies, often includes glazed walls. Double glazing. Energy efficiency will vary; these generally achieve a moderate efficiency rating of C+.	Between 1990 and 2005 (includes upgraded second-generation blocks)
Office Type E	Fourth-generation office space	Like third-generation blocks but more efficient. Environmentally sensitive air handling, heating and energy systems. Typically achieving a B1 to A3 BER rating. High-quality finishes and large floor plates.	Built since 2005

Classifications were guided by the Office of Public Works 2022 report.[16]

[16] Office of Public Works. An Assessment of the Balance of Current and Capital Expenditure: OPW Estate Management Portfolio. 2022.

AN EXAMINATION OF THE FINANCIAL RETURN WITH THE RETROFITTING OF OFFICE BUILDINGS

To evaluate retrofitting costs and estimated values for this study, the SCSI utilised a team of experienced Chartered Quantity and Valuation Surveyors.

For consistency, we applied a standard retrofit elemental scope for case studies received, using CAT A fit-outs as a benchmark.

CAT A

A CAT A fit-out is a basic level of interior finishing in a commercial building, typically provided by the property owner. It includes essential structural and functional elements but lacks final customisation for a tenant's specific needs. A CAT A fit-out usually covers raised floors and suspended ceilings, basic M&E services (lighting, HVAC, fire detection systems), basic wall finishes and flooring, plumbing and restrooms (if part of the core structure) and general decoration (such as painted walls). A Cat B fit-out involves the tenant's customisations, such as partition walls, branding, furniture, and final design elements.

Table 1: Summary of buildings included in case studies.

Case study ID	Age	BER change	Size (gross floor area – approximate)	Condition	Location	SCSI valuation hurdle
Case Study 1	60 years	Not available -B2	9,000m^2	Fair condition	Dublin 2	Retrofitting financial viability hurdle not met
Case Study 2	20 years	D-A3	18,000m^2	Good condition	Dublin 1	Retrofitting financial viability hurdle not met
Case Study 3	25 years	D2-A3	12,000m^2	Fair condition	Dublin 1	Retrofitting financial viability hurdle met
Case Study 4	25 years	C2-B2	11,000m^2	Good condition	Dublin 2	Retrofitting financial viability hurdle met
Case Study 5	35 years	E1-B2	5,400m^2	Good condition	Dublin, Glasnevin	Retrofitting financial viability hurdle met
Case Study 6	40 years	D-B	4,000m^2	Poor condition	Dublin, Blackrock	Retrofitting financial viability hurdle not met
Case Study 7	20 years	E1-C1	12,000m^2	Good condition	Dublin 2	Retrofitting financial viability hurdle not met

Case study statistics

The seven selected case studies were in Dublin. The commercial properties in this study ranged in gross floor area from approximately 4,000m² to 12,000m². The properties were in Dublin 1 (two case studies), Dublin 2 (three case studies) and the suburban areas (two case studies – Blackrock and Glasnevin). Retrofit works demonstrating an improvement in BER are reflected in all case studies, with the minimum energy rating received post retrofits being a C1. The largest increase in BER was from E1 to B2 (Case Study 5). The case studies also ranged in condition status from 'Occupiable – good condition' (four case studies), to 'Occupiable – fair condition' (two case studies) and 'Occupiable – poor condition' (one case study). The following section breaks down each case study and its associated costs, with the core retrofit works identified. **Figures 3** and **4** summarise the costs of retrofit for each case study.

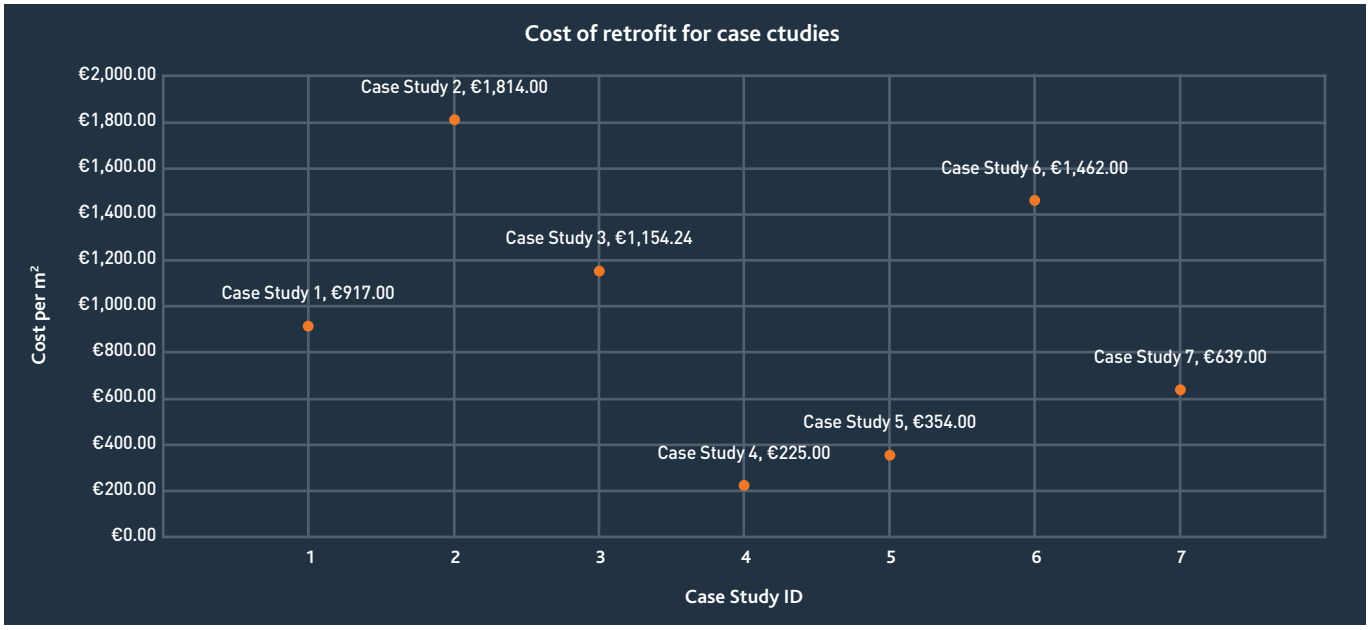


FIGURE 3: Cost per square metre for case studies used in this research.

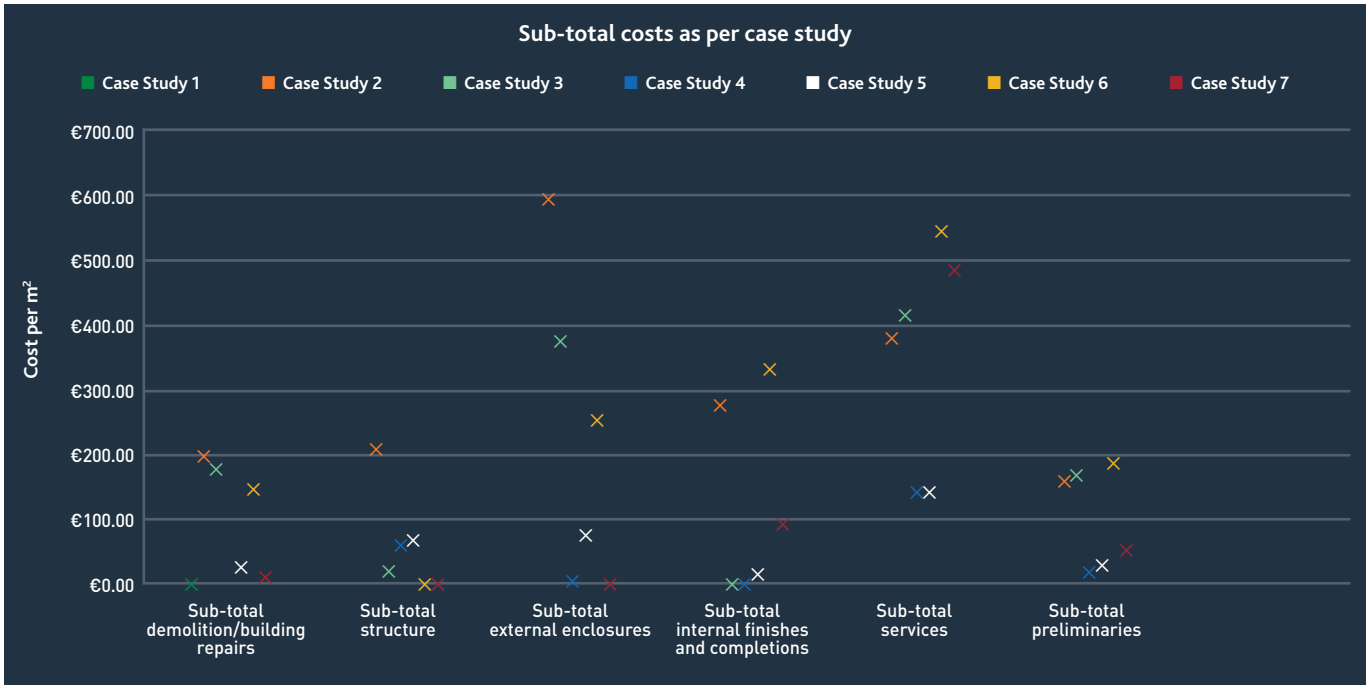


FIGURE 4: Cost per square metre of sub-total costs.

CASE STUDY 1

DUBLIN 2, TYPE B – FIRST-GENERATION OFFICE SPACE

1

Building details

Characteristic	Details
Location	Dublin 2
Office type classification	Type B – First-generation office space – typically characterised as: • basic internal finishes; • may have solid internal partitions to individual offices; • no raised floors; • average or low ceiling height; • smaller floor plates; • single-glazed windows; • open floor areas with pillars; • may not have air conditioning and lifts; and, • exterior cladding is often pre-cast concrete sections.
Age of building	60 years
Retrofit completion date	Partial completion achieved on CAT A fit-out – Q4 2023
Number of floors	8
Total gross floor area (rounded)	9,000m^2
Total net floor area (rounded)	5,000m^2
Condition prior to retrofit	Occupiable – fair condition
Building Energy Rating before the retrofit was completed	Not available
Building Energy Rating after the retrofit was completed	B2
Scope of works related to the case study	Demolition included soft-strip demolition (typically undertaken by hand) and heavy demolition (typically completed by plant machinery), including asbestos removal. Existing façades were patched. New façades involved in an extension were excluded from the costs following review. Full core and shell, and CAT A fit-out. All existing services were removed. Part of the building was protected.

Hard costs of retrofit – cost per m^2

Element group	Scope of works	Costs – per m^2	Cost as a percentage of total retrofit cost
Sub-total for demolitions	Costs included the partial demolition of aspects of the building, including dismantling and removal of specified structural and non-structural elements while preserving the integrity of the remaining structure. This involved partial demolition of internal walls, ceilings, flooring, partitions, M&E systems, and exterior façades as required by the retrofitting plans. Measures included dust suppression, noise control, and waste management. The demolition was mainly focussed on 'soft' strip-out.	€72	7.8%
Sub-total for structural works	Costs for structural works that were related to the retrofit included the repairs to the existing concrete floors.	€15	1.6%
Sub-total for external enclosures	Costs included block and brickwork to the external walls. Costs also included repairs to the plaster and painting of these walls, and installation of a green roof system (which includes rainwater drainage).	€236	25.7%
Sub-total for works on the internal finishes and completions	All costs related to finishes were scoped out of the cost template as they related to a wider extension project and were not specifically within scope of the cost of retrofitting.	No costs	0%
Sub-total for works associated with services	Sanitary fittings included a shell and core fit-out. Costs for the services were calculated pro rata to apply to the original footprint of the building only and not considering costs associated with the extension proposed as part of the wider project. Ventilation, more efficient gas-fired heat generation, and light fittings were all upgraded as part of the retrofit works. A building management system was also installed.	€489	53.2%
Sub-total for preliminaries	The preliminaries were calculated based on a pro-rata rate of the value of the retrofit works compared to the total shell and core works. These are one-off costs associated with the construction works, such as scaffolding, cost of power to plant, site security, health and safety, and other related overheads.	€107	11.6%
Total cost – per m^2		**€917 (rounded)**	**100% (rounded)**

Valuation statistics for Case Study 1 (excluding VAT)

Valuation type	Percentage
Percentage uplift on estimated value – post retrofit	51.9%
Percentage uplift on rents – post retrofit	60.2%
Improvement in net yield – post retrofit	1.5%
Net Effect** as a percentage of cost of retrofit	-14.3%
Viability outcome	**Retrofitting financial viability hurdle not met***

* **Excluding SEAI/other similar grants**

** **Net Effect is calculated as the difference between the retrofit costs and the change in estimated value before and after the retrofit, divided by the future estimated valuation and expressed as a percentage.**

CASE STUDY 2

DUBLIN 1, TYPE D – THIRD-GENERATION OFFICE SPACE

2

Building details

Characteristic	Details
Location	Dublin 1
Office type classification	Type D – Third-generation office space – typically characterised as: • large open floor plates; • pillars well spaced; • ground floor atriums may be present; • higher ceilings to accommodate raised floors; • raised floors for computer cabling; • air conditioning and lifts usually present; • exterior cladding varies and often includes glazed walls; • double glazing of windows; and, • energy efficiency will vary – these offices can generally achieve a moderate efficiency rating of C+.
Age of building	20 years
Retrofit completion date	Project works ongoing
Number of floors	9 (including the basement)
Total gross floor area (rounded)	18,000m^2
Total net floor area (rounded)	12,000m^2
Condition	Occupiable – good condition
Building Energy Rating before the retrofit was completed	D
Building Energy Rating after the retrofit was completed	A3
Scope of works related to the case study	Strip-out of entire existing building. Approx. 25% of the building was demolished to incorporate the new core – all new floor, wall and ceiling finishes. All new M&E services to whole building (excluding building extension) – replacement of existing heat pumps and installation of solar photo-voltaic (PV) systems.

Hard costs of retrofit – cost per m²

Element group	Scope detailed	Costs – per m²	Cost as a percentage of total retrofit cost
Sub-total for demolitions	Costs included stripping out of the entire footprint. Demolition of approximately one-quarter of the footprint of the building to accommodate a redeveloped core. A façade was removed as part of the works. Some remedial works to damaged concrete, scabbling and hole repairs.	€197	10.8%
Sub-total for structural works	Costs for structural works included basement works including the piles under the cores, reinforced concrete (RC) core walls and RC columns, internal wall completions, floor, wall and ceiling finishes. Roof works included installation of steel beams, metal composite deck and RC floor slabs.	€209	11.5%
Sub-total for external enclosures	Costs for external enclosures included installation of aluminium and glass rainscreens to cores of existing walls. Installation of Bauder warm roof system and a green roof. Windows and external doors work included installation of a mixture of unsized twin wall and stick glazing to the office floor plate. Polyester powder coating (PPC) aluminium rainscreen installed to the core walls. Roof glazing including installing a saw-tooth roof light to the top of the atrium.	€594	32.7%
Sub-total for works on the internal finishes and completions	New timber doors were installed to the accessible areas, metal doors were installed to risers. Internal wall finishes included the use of paint, tiling, stone and timber. Ceiling finishes included the use of plasterboard and installation of timber slat. Floor finishes included tiling, poured terrazzo and paint.	€278	15.3%
Sub-total for works associated with services	Sanitary fittings included installation of new bathrooms, integrated plumbing system (IPS) panels, vanity units and cubicle systems. Other services costed to existing building and not including the new floors installed. Rainwater disposal installation, ventilation includes smoke extract ductwork, jet fans, fan coil units (FCUs) and air-handling units (AHUs). Air source heat pump, water calorifiers, circulating pumps installed for domestic hot water. Heat generation improved through installation of heat pumps, underfloor heating and space heating. PV panels, general lighting, emergency lighting, electric vehicles for chargers installed as part of the services upgrades.	€380	20.9%
Sub-total for preliminaries	Preliminaries are one-off costs associated with the construction works, such as scaffolding, cost of power to plant, site security, health and safety, and other related overheads.	€159	8.7%
Total cost – per m²		**€1,814 (rounded)**	**100% (rounded)**

Valuation statistics for Case Study 2 (excluding VAT)

Valuation type	Percentage
Percentage change in estimated value following retrofit works	46.5%
Percentage change in rental income received following retrofit works	49.8%
Improvement in net yield following retrofit works	1.0%
Net Effect** as a percentage of cost of retrofit	-23.1%
Estimation on project viability because of core retrofit works	**Retrofitting financial viability hurdle not met***

* **Excluding SEAI/other similar grants**

** **Net Effect is calculated as the difference between the retrofit costs and the change in estimated value before and after the retrofit, divided by the future estimated valuation and expressed as a percentage.**

CASE STUDY 3

DUBLIN 1, TYPE D – THIRD-GENERATION OFFICE SPACE

3

Building details

Characteristic	Details
Location	Dublin 1
Office type classification	Type D – Third-generation office space – typically characterised as: • large open floor plates; • pillars well spaced; • ground floor atriums may be present; • higher ceilings to accommodate raised floors; • raised floors for computer cabling; • air conditioning and lifts usually present; • exterior cladding varies and often includes glazed walls; • double glazing of windows; and, • energy efficiency will vary – these offices can generally achieve a moderate efficiency rating of C+.
Age of building	25 years
Retrofit completion date	Project completed in 2022
Number of floors	6 floors
Total gross floor area (rounded)	12,000m^2
Total net floor area (rounded)	7,000m^2
Condition	Occupiable – fair condition
Building Energy Rating before the retrofit was completed	D2
Building Energy Rating after the retrofit was completed	A3
Scope of works related to the case study	Demolition of the basement area to accommodate new works and demolition of the existing façade. Removal of significant portion of the existing curtain walling façade, with upgrade to contemporary façade system. Upgrading to the core and shell elements with a CAT A fit-out. Wholesale replacement of M&E systems to achieve a LEED Platinum rating.

Hard costs of retrofit – cost per m²

Element group	Scope detailed	Costs – per m²	Cost as a percentage of total retrofit cost
Sub-total for demolitions	Costs for demolition included works done to the basement areas to accommodate new works, demolition of the existing façade, reception area, office floors and M&E infrastructure.	€178	15.3%
Sub-total for structural works	New roof works included use of bitumen felt and reinsulation. Frame works included improvement of insulation. A portion of the basement works was completed to accommodate MEP and soffit.	€21	2.7%
Sub-total for external enclosures	External walls included significant replacement of the existing façade, which was key to improving the energy performance of the building. Finishes to the external wall also helped improve the BER. Investment in new windows and doors also completed.	€375	32.1%
Sub-total for works on the internal finishes and completions	All costs were excluded from the research as they were outside the scope of the research brief.	No costs	0%
Sub-total for works associated with services	Service works included rainwater strategy and harvesting improved in relation to LEED certification. Ventilation, domestic hot water and heat generation all improved as part of the works. Electrical services included control and smart upgrades, light fitting upgrades, and building investment installations. Sanitary included improvements based on sustainable parameters associated with LEED.	€415	35.6%
Subtotal for preliminaries	Preliminaries are one-off costs associated with the construction works, such as scaffolding, cost of power to plant, site security, health and safety, and other related overheads.	€167	14.3%
Total cost – per m²		**€1,154 (rounded)**	**100% (rounded)**

Valuation statistics for Case Study 3 (excluding VAT)

Valuation type	Percentage
Percentage change in estimated value following retrofit works	72.7%
Percentage change in rental income received following retrofit works	50%
Improvement in net yield following retrofit works	4.0%
Net Effect** as a percentage of cost of retrofit	3.6%
Estimation on project viability because of core retrofit works	**Retrofitting financial viability hurdle met***

* **Excluding SEAI/other similar grants**

** **Net Effect is calculated as the difference between the retrofit costs and the change in estimated value before and after the retrofit, divided by the future estimated valuation and expressed as a percentage.**

CASE STUDY 4

DUBLIN 2, TYPE D – THIRD-GENERATION OFFICE SPACE

4

Building details

Characteristic	Details
Location	Dublin 2
Office type classification	Type D – Third-generation office space – typically characterised as: • large open floor plates; • pillars well spaced; • ground floor atriums may be present; • higher ceilings to accommodate raised floors; • raised floors for computer cabling; • air conditioning and lifts usually present; • exterior cladding varies and often includes glazed walls; • double glazing of windows; and, • energy efficiency will vary – these offices can generally achieve a moderate efficiency rating of C+.
Age of building	25 years
Retrofit completion date	Project on site – due to be completed Q1 2025
Number of floors	7 floors
Total gross floor area (rounded)	11,000m^2
Total net floor area (rounded)	8,000m^2
Condition	Occupiable – good condition
Building Energy Rating before the retrofit was completed	C2
Building Energy Rating after the retrofit was completed	B2
Scope of works related to the case study	Majority of works featured a strong M&E replacement strategy, including upgrades to the air-handling unit, and replacement of boilers with heat pumps.

Hard costs of retrofit – cost per m^2

Element group	Scope detailed	Costs – per m^2	Cost as a percentage of total retrofit cost
Sub-total for demolitions	No costs were incurred relating to this scope of work.	No costs	0%
Sub-total for structural works	Structural works related strictly to the roof, where there was a replacement of the roof and terrace coverings.	€60	26.5%
Sub-total for external enclosures	Installation of a green roof was completed as part of the retrofit works.	€5	2.1%
Sub-total for works on the internal finishes and completions	No costs were incurred relating to this scope of work.	No costs	0%
Sub-total for works associated with services	Service costs included replacement and upgrade of heating systems – including installation of heat pumps. Smart controls, solar arrays and LED upgrades were also completed.Sanitary fittings included installation of new fittings where existing ones could not be retained.	€142	63.2%
Sub-total for preliminaries	Preliminaries are one-off costs associated with the construction works, such as scaffolding, cost of power to plant, site security, health and safety, and other related overheads.	€19	8.3%
Total cost – per m^2		**€225 (rounded)**	**100% (rounded)**

Valuation statistics for Case Study 4 (excluding VAT)

Valuation type	Percentage
Percentage change in estimated value following retrofit works	42.9%
Percentage change in rental income received following retrofit works	0%
Improvement in net yield following retrofit works	1.5%
Net Effect** as a percentage of cost of retrofit	26.9%
Estimation on project viability because of core retrofit works	**Retrofitting financial viability hurdle met***

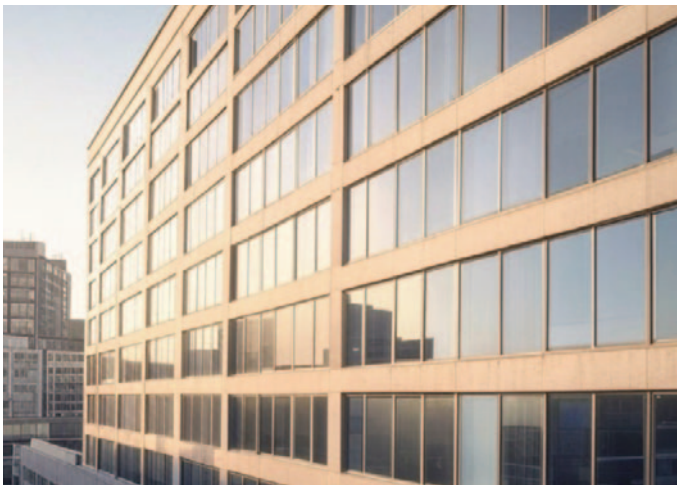
* **Excluding SEAI/other similar grants**

** **Net Effect is calculated as the difference between the retrofit costs and the change in estimated value before and after the retrofit, divided by the future estimated valuation and expressed as a percentage.**

CASE STUDY 5

DUBLIN, GLASNEVIN, TYPE C – SECOND-GENERATION OFFICE

5



Building details

Characteristic	Details
Location	Dublin, Glasnevin
Office type classification	Type C – Second-generation office – typically characterised as: • basic internal finishes; • may have solid internal partitions to individual offices; • no raised floors; • average or low ceiling heights; • smaller floor plates; • single-glazed windows; • open floor areas often have numerous pillars; • may or may not have air conditioning and lifts; and, • exterior cladding is often pre-cast concrete sections.
Age of building	35 years
Retrofit completion date	Project completed in 2023
Number of floors	3 floors
Total gross floor area (rounded)	5,400m^2
Total net floor area (rounded)	4,200m^2
Condition	Occupiable – good condition
Building Energy Rating before the retrofit was completed	E1
Building Energy Rating after the retrofit was completed	B2
Scope of works related to the case study	Demolition works limited to the removal of reveals to install an airtightness membrane. Replacement of all lighting with LED and modifications to mechanical plant included in the scope of works.

Hard costs of retrofit – cost per m^2

Element group	Scope detailed	Costs – per m^2	Cost as a percentage of total retrofit cost
Sub-total for demolitions	Demolition works included removal of window reveals, removal of roof plant and associated temporary works. Ceiling in corridors of building also removed.	€26	7.3%
Sub-total for structural works	Roof was fitted with new insulation and membrane in combination with lighting protection.	€68	19.2%
Sub-total for external enclosures	External walls works included pumping of cavity walls.	€76	21.2%
Sub-total for works on the internal finishes and completions	Costs to the external enclosure were associated with finishes to both the internal walls and the ceiling.	€15	4.1%
Sub-total for works associated with services	Costs associated with ceilings included investment in improved ventilation, hot water services and heat generation. Control and smart upgrades also included.	€143	40.2%
Sub-total for preliminaries	Preliminaries are one-off costs associated with the construction works such as scaffolding, cost of power to plant, site security, health and safety, and other related overheads.	€27	8%
Total cost – per m^2		**€354 (rounded)**	**100% (rounded)**

Valuation statistics for Case Study 5 (excluding VAT)

Valuation type	Percentage
Percentage change in estimated value following retrofit works	122%
Percentage change in rental income received following retrofit works	66%
Improvement in net yield following retrofit works	5%
Net Effect** as a percentage of cost of retrofit	33.7%
Estimation on project viability because of core retrofit works	**Retrofitting financial viability hurdle met***

* **Excluding SEAI/other similar grants**

** **Net Effect is calculated as the difference between the retrofit costs and the change in estimated value before and after the retrofit, divided by the future estimated valuation and expressed as a percentage.**

CASE STUDY 6

CO. DUBLIN – BLACKROCK, TYPE C – SECOND-GENERATION OFFICE

6

Building details

Characteristic	Details
Location	Co. Dublin – Blackrock
Office type classification	Type C – Second-generation office – typically characterised as: • basic internal finishes; • may have solid internal partitions to individual offices; • no raised floors; • average or low ceiling heights; • smaller floor plates; • single-glazed windows; • open floor areas often have numerous pillars; • may or may not have air conditioning and lifts; and, • exterior cladding is often pre-cast concrete sections.
Age of building	40 years
Retrofit completion date	Project was tendered but did not proceed to construction
Number of floors	6 floors (including basement)
Total gross floor area (rounded)	4,000m^2
Total net floor area (rounded)	3,000m^2
Condition	Occupiable – poor condition
Building Energy Rating before the retrofit was completed	D1
Building Energy Rating after the retrofit was completed	B
Scope of works related to the case study	Demolition to include removal of the existing external façade, demolition of cores, and removal of existing floor and ceiling finishes. Building reconstructed to CAT A specifications. Full replacement of AC systems, electrical radiation panels installed. New building management systems, electric vehicle (EV) charging and PV installations included in costs.

Costs of retrofit – cost per m²

Element group	Scope detailed	Costs – per m²	Cost as a percentage of total retrofit cost
Sub-total for demolitions	Demolition costs included the strip-outs to shell, decommissioning and removal of services.	€147	10%
Sub-total for structural works	No works to the structure were included as part of these works.	No costs	0%
Sub-total for external enclosures	Roof finishes included installation of a new PVC roof membrane. New aluminium curtain wall system throughout.	€254	17.4%
Sub-total for works on the internal finishes and completions	New hardwood door sets and fire-rated (FR) screens installed throughout including access control. Drylining of cores and decoration. Floor finishes restricted to core and circulation finishes only. Ceiling finishes include plasterboard (PB) ceilings and details to common areas including ancillaries.	€331	22.7%
Sub-total for works associated with services	Service costs included new internal downpipes to rainwater disposal system, CAT A specification for ventilation, installation of domestic hot water and heat generation. Light fitting upgrades also costed, and EV charging points. Sanitary fittings included a full new fit-out of each floor.	€544	37.2%
Sub-total for preliminaries	Preliminaries are one-off costs associated with the construction works such as scaffolding, cost of power to plant, site security, health and safety, and other related overheads.	€187	12.7%
Total cost – per m²		**€1,462 (rounded)**	**100% (rounded)**

Valuation statistics for Case Study 6 (excluding VAT)

Valuation type	Percentage
Percentage change in estimated value following retrofit works	61.1%
Percentage change in rental income received following retrofit works	18.8%
Improvement in net yield following retrofit works	1.5%
Net Effect** as a percentage of cost of retrofit	-73.1%
Estimation on project viability because of core retrofit works	**Retrofitting financial viability hurdle not met***

* **Excluding SEAI/other similar grants**

** **Net Effect is calculated as the difference between the retrofit costs and the change in estimated value before and after the retrofit, divided by the future estimated valuation and expressed as a percentage**

CASE STUDY 7

DUBLIN 2, TYPE D – THIRD-GENERATION OFFICE SPACE

7

Building details

Characteristic	Details
Location	Dublin 2
Office type classification	Type D – Third-generation office space – typically characterised as: • large open floor plates; • pillars well spaced; • ground floor atriums may be present; • higher ceilings to accommodate raised floors; • raised floors for computer cabling; • air conditioning and lifts usually present ; • exterior cladding varies and often includes glazed walls; • double glazing of windows; and, • energy efficiency will vary – these offices can generally achieve a moderate efficiency rating of C+.
Age of building	20 years
Retrofit completion date	Project completed in 2022
Number of floors	7 floors
Total gross floor area (rounded)	12,000m^2
Total net floor area (rounded)	11,000m^2
Condition	Occupiable – good condition
Building Energy Rating before the retrofit was completed	E1
Building Energy Rating after the retrofit was completed	C1
Scope of works related to the case study	Demolitions included removal of floor finishes and ceilings, new floor, ceiling and wall finishes, as well as full strip-out of M&E services and installation of new systems including new plant.

Hard costs of retrofit – cost per m²

Element group	Scope detailed	Costs – per m²	Cost as a percentage of total retrofit cost
Sub-total for demolitions	Demolition costs included strip-out of existing furniture, internal floor, walls, ceiling finishes, doors, etc., to accommodate M&E upgrades.	€10	1.6%
Sub-total for structural works	No works to the structure were included as part of these works.	No costs	0%
Sub-total for external enclosures	No works to the external enclosures were included as part of these works.	No costs	0%
Sub-total for works on the internal finishes and completions	Modifications to the internal walls included the installation of a high fixed structural slab and structural soffit. Walls finished with refresh or recordation after M&E works. Replacement of some of the internal doors (timber, roller and glazed). Floor finishes included new carpet and vinyl flooring and plywood laid to raised access floor. Ceiling finishes included new suspended acoustic baffle and retention of some existing plasterboard ceiling and painting to plasterboard.	€92	14.4%
Sub-total for works associated with services	Cost of services included full replacement of ventilation system and associated ductwork. New pipes and water meter and connections for hot water, new low-temperature heat pump and associated connections. New luminaries, controls and emergency lighting installed. BMS control system and power supplies also installed.	€484	75.8%
Sub-total for preliminaries	Preliminaries are one-off costs associated with the construction works such as scaffolding, cost ofpower to plant, site security, health and safety, and other related overheads.	€53	8.2%
Total cost – per m²		**€639**	**100% (rounded)**

Valuation statistics for Case Study 7 (excluding VAT)

Valuation type	Percentage
Percentage change in estimated value following retrofit works	5%
Percentage change in rental income received following retrofit works	40%
Improvement in yield following retrofit works	1.0%
Net Effect** as a percentage of cost of retrofit	-15.0%
Estimation on project viability because of core retrofit works	**Retrofitting financial viability hurdle not met***

* **Excluding SEAI/other similar grants**

** **Net Effect is calculated as the difference between the retrofit costs and the change in estimated value before and after the retrofit, divided by the estimated valuation and expressed as a percentage.**

INTERPRETATIONS OF THE COST AND VALUATION DATA

This research evaluates the interplay between retrofitting costs and property valuation for office building case studies, focusing on specific parameters.

The study targeted the cost of retrofitting office blocks with a CAT A fit-out – basic structural and systems upgrades – rather than total project costs, which originally included additional items such as extensions to buildings, extra mezzanine floors, etc. As a result, the calculated costs exclude value-engineering elements and instead focus solely on the ESG aspects of retrofitting buildings.

For valuation purposes, Chartered Valuation Surveyors employed a vacant possession assumption when detailing the valuation metrics used in this report. This assumes that the properties were empty and available for immediate occupancy.

This approach, which excludes existing rental income, typically results in lower estimated values compared to valuations with active leases. Consequently, the calculated percentage uplift post retrofit and the overall Net Effect – a key indicator in this report for financial viability – are influenced. Furthermore, financing and upgrade timing, while outside this report's scope, are critical considerations for retrofit strategies. Collaboration between building owners and tenants, particularly during dilapidations, presents opportunities to develop roadmaps for improved energy performance. The complex owner-tenant

Collaboration between building owners and tenants, particularly during dilapidations, presents opportunities to develop roadmaps for improved energy performance. The complex owner-tenant relationship warrants further investigation, especially regarding split incentives, financing, and replacement schedules for key infrastructure within the asset.

The cost of doing nothing in terms of commercial retrofitting will directly impede property owners' ability to attract high-quality tenants as the market increases its focus on sustainable assets.

relationship warrants further investigation, especially regarding split incentives, financing, and replacement schedules for key infrastructure within the asset. Commercial building owners with poorly performing, low-BER assets face the risk of future obsolescence, stranding and unoccupancy. While four case studies did not meet the viability criteria based on enhanced estimated value, this research clearly demonstrates that investment in commercial office retrofits results in a distinct uplift in rental values (between 0% and 66%) and improvement in net yields (between 1% and 5%) (**Table 3**).

This results in an overall increase in the estimated value of the asset demonstrated across all assets (between 5% and 122%). Furthermore, it was the view of the Chartered Valuation Surveyors involved in this research that investment in building upgrades futureproofs assets from the risk of tighter regulatory risk as we approach 2030 and beyond.

Potential reductions in the costs of retrofit can be achieved through different grant opportunities, which were specifically not incorporated into the scope of this research but have the potential to increase the viability of an office retrofit.

The Sustainable Energy Authority of Ireland (SEAI) offers various grants to support energy efficiency projects, catering to both small and large-scale building owners who are seeking to improve the energy performance of their building. Property owners can apply for grants that cover the costs relating to various aspects of the retrofit project (e.g., energy audit, individual energy efficiency measures, costs directly associated with the retrofit).

Funding from the SEAI, through programmes such as the Business Energy Upgrade Scheme (BEUS), EXEED or Community Energy Grants, can reduce the costs of specific aspects of the retrofit by up to 50%,

Table 3: Summary of case studies, including viability assessment post retrofit.

Case study ID	Case Study 1	Case Study 2	Case Study 3	Case Study 4	Case Study 5	Case Study 6	Case Study 7
Net floor area	5,000m^2	12,000m^2	7,000m^2	8,000m^2	4,200m^2	3,000m^2	11,000m^2
% change in estimated value	51.9%	46.5%	72.7%	42.9%	122%	61.1%	5%
% change in potential rent	60.2%	49.8%	50%	0%	66%	18.8%	40%
% change in yield	1.5%	1.0%	4.0%	1.5%	5%	1.5%	1.0%
Net Effect as a % of post-retrofit works	-14.3%	-23.1%	+3.6%	+26.9%	+33.7%	-73.1%	-15.0%
Cost of retrofit	€917/m^2	€1,814/m^2	€1,154/m^2	€225/m^2	€354/m^2	€1,462/m^2	€639/m^2
SCSI valuation hurdle	Retrofitting financial viability hurdle not met	Retrofitting financial viability hurdle not met	Retrofitting financial viability hurdle met	Retrofitting financial viability hurdle met	Retrofitting financial viability hurdle met	Retrofitting financial viability hurdle not met	Retrofitting financial viability hurdle not met

depending on the scale of works required and the eligibility criteria for the different grants. It is recommended that building owners who require access to grants from the SEAI, or other financing sources, get appropriate professional advice.

Offices maintained in good condition

Case Studies 2, 4, 5 and 7 are office blocks defined as in 'good condition'. They are in Dublin 1 (Case Study 2), Dublin 2 (Case Studies 4 and 7) and Glasnevin, Dublin (Case Study 5). These buildings, aged 20-35 years, had a minimum energy rating of E1 before retrofitting. Their sizes ranged from 5,400m^2 to 18,000m^2 in gross floor area. Retrofitting costs varied widely depending on the scope of the works, the final BER achieved, location, and other project specifics. For the Dublin city centre properties (Case Studies 2, 4 and 7), costs ranged from €225/m^2 to €1,814/m^2, reflecting the complexity of commercial retrofitting and the need to assess each project individually. In Glasnevin (Case Study 5), costs were in the lower range at €354/m^2. Case Study 7 was in the middle of the range at €639/m^2.

Case Study 2 exhibited the highest total retrofit costs, approximately €32 million, significantly exceeding the costs of other projects: €2.4 million for Case Study 4, €1.7 million for Case Study 5, and €5.6 million for Case Study 7. This substantial difference primarily reflects the scale and depth of the retrofitting works undertaken. While both Case Study 2 (18,000m^2) and Case Study 7 (12,000m^2) are large buildings, their approaches to improving energy efficiency varied considerably.

The outcomes of these approaches are evident in the achieved BER. Case Study 2 attained an A2 rating, indicating a highly efficient building, while Case Study 7 achieved a C2 rating. Notably, Case Study 7 began with a lower baseline rating of E1, compared to Case Study 2's initial D rating, demonstrating a significant improvement. To achieve these results the case studies employed distinct strategies. Case Study 2 could be argued to have adopted a 'fabric first' approach, prioritising improvements in the building's thermal envelope. Approximately 44% of the project's budget was invested in enhancing the external structure and enclosure. This strategy provides the additional benefit of futureproofing the asset by maximising its inherent energy efficiency, reducing long-term energy consumption. Case Study 7, in contrast, focused on building services, allocating 76% of its budget to these improvements. This investment did beneficially improve the BER rating but failed to look at investing in the building envelope.

While the costs for Case Study 2, on a square metre basis, are almost three times higher than those of Case Study 7, the enhanced thermal efficiency and heat retention of Case Study 2 should in theory see greater savings in the long run. To a lesser extent, Case Study 4 also participated in a retrofit that focused solely on services (63%) and cost €225/m^2. This improved the BER rating from a C2 to a B2. How retrofits are approached will be fundamental to achieving a decarbonised building stock. While some of the case studies presented here demonstrate that significant investment in services can achieve a favourable BER rating, the long-term viability of this approach warrants further research. In theory, a 'fabric first' approach, such as the one carried out in Case Study 2, would see longer-term benefits to the building owner compared to the works carried out in the other two examples.

Offices maintained in fair condition

Case Studies 1 and 3 are commercial properties in fair condition. Located in Dublin 2, they range in age from 25 to 60 years. Case Study 3 is larger (12,000m^2) compared to Case Study 1 (9,000m^2).

Core retrofitting costs for the properties ranged from c. €917 to €1,154 per m^2. These costs are located closely together in comparison to the overall number of case studies.

Total costs were approximately €8.4m and €14.2 million. The highest contributor to the overall costs is services for Case Study 1 (53.3%) and Case Study 3 (35.6%), with costs for the external enclosures also an important contribution (26.7% and 32.1%, respectively). Costs for the external enclosures were the second and third highest across all the case studies, with additional works regarding finishes to the roof, roof glazing and works to the external walls all important contributors.

Both Case Study 1 and Case Study 3 reached a high BER following the retrofit works, B2 and A3, respectively. This is likely mainly driven by the costs invested in services, with both retrofits investing heavily in lighting upgrades and improved ventilation.

Case Study 3 also invested heavily in new smart upgrades in the facility as well as building management systems (BMS) installations, with lower amounts invested in Case Study 1. This may help to explain why Case Study 3 achieved a higher BER than Case Study 1, despite relatively similar investments on a per square metre basis.

Office maintained in Poor condition

Out of the seven offices used in this research, only one was classified as being in 'Occupiable – poor condition' (Case Study 6). This office was in Blackrock, approximately 40 years old, and achieved a BER improvement from D1 to B.

This property had the fourth highest cost per square metre among all case studies, at €1,462. A significant portion of these costs were attributed to services (approximately 37%). Costs to the external enclosures (17.4%) and to the internal finishes and completions (22.7%) were also significant contributors. This is unsurprising given the building's condition, which necessitated additional finishing to enhance the standard of the property and meet their CAT A specifications.

OBSERVATIONS

In supporting this report, we in AIB would like to share the experiences we have when it comes to our customers retrofitting their properties. A significant portion of our customer base are landlords with an occupied commercial building seeking to improve the energy performance of their property as measured through the BER certification process.

Their decision to make this investment is primarily driven by three factors:

1. Regulation

While the overall regulatory landscape requires increasingly high standards from businesses, the Energy Performance Building Directive (EPBD) is of particular relevance to commercial landlords. This has been passed into law at a European level and is due to be transposed into Irish law by May 2026. This will drive minimum energy standards for property assets and will, for the first time, introduce the legal concept of a stranded asset, i.e., one that cannot be traded due to its energy performance.

2. Tenants

In addition to increased financial reporting requirements for companies, an increased focus on a company's ESG performance from various stakeholders is also a reality. A major contributory factor to Scope 1 and 2 performances for any company is the property it occupies, and AIB has seen a number of cases whereby a tenant has approached their landlord to request an improved energy performance rating.

3. Access to capital

Funders often make their own ESG commitments, resulting in the careful consideration of assets on balance sheets. This is certainly the case with AIB, where we have committed to reducing the carbon emissions in our property loan book by 67% by 2030, and to be net zero in our lending operations by 2050. This combination of regulatory, tenant and funding factors results in landlords reviewing the future viability of their properties. While a decision not to invest in a property to improve its energy performance may initially appear reasonable, a longer-term focus will typically change that view. In AIB, when considering

REAL COST OF RETROFITTING

funding a project, we typically take a longer-term approach, which considers the future renters, buyers, and funders of the property.

It is also our experience that the approach to retrofitting is constantly evolving. In the past, the optimum route was to undertake a deep retrofit on an empty property in a short time frame. However, more recently the need to maintain income from the property has often led to retrofitting works being undertaken over a longer time frame. As a result, the typical customer in AIB will now undertake retrofitting works over a three- to five-year period.

Our customers normally approach us with phased, costed plans with the cashflow of the building being used to fund the works. While for the purposes of this report available grants are not incorporated into the Net Effect approach, in AIB's experience grants are very supportive in ensuring viability for commercial retrofits.

The estimated costs, netted by available grants, are presented as an overall package to the bank in an integrated cashflow over the term of the loan. If the age of the property is such that mechanical and electrical elements have reached end of life, then the works are timed to incorporate this change.

This approach is more akin to enhanced asset management and less like the deep retrofitting experiences of the past.

The longer-term approach also requires additional collaboration with tenants, as works need to take place around tenants' operations. AIB's experience shows that tenants are willing to work with landlords as, ultimately, they will benefit from the improved energy efficiency of the building and the reduction in Scope 1 and 2 emissions.

In AIB we have seen how the improved landlord/tenant collaboration has resulted in increasing adoption of 'green leases', which incorporate the sharing of energy usage data with the landlord and 'do no harm' clauses to the BER rating when tenant refurbishments are being undertaken.

It is therefore evident to AIB that being green does not require going into the red. While also mitigating embedded carbon, the business case for retrofitting is clear. Rents can be improved, yields are typically reduced, and the relationship between landlord and tenant can be enhanced.

CONCLUSIONS AND POLICY RECOMMENDATIONS

This report, commissioned by the SCSI, provides a critical analysis of the real costs and financial impact of commercial office retrofitting.

This research is aimed at improving the fundamental understanding of the challenges associated with retrofitting commercial offices, which is vital for understanding the path to decarbonise commercial building stock by 2050, in line with evolving EU legislation. The research clearly demonstrates that, based on the case studies received, there are scenarios in which retrofitting can be completed and viable, through the rise in estimated value of the property. Our analysis of seven diverse case studies reveals a wide range of retrofit costs, from €225/m^2 to €1,814/m^2, primarily driven by the scope of required upgrades. Grouping the case studies into 'Good', 'Fair' and 'Poor' condition categories (€225-€1,814/m^2, €917-€1,154/m^2, and €1,462/m^2, respectively) underscores the necessity for tailored, case-by-case assessments. Notably, the complexity of retrofitting is highlighted by the observation that higher service upgrade investments did not always correlate with improved BER. This emphasises the importance of setting clear, strategic objectives for each project.

It is important to note that this report focuses on direct (hard) construction costs (e.g., finishes, service installation, potential demolition works) and excludes soft costs (e.g., site acquisition, professional fees, and VAT). Therefore, to obtain a comprehensive financial picture of a specific retrofit project, consultation with qualified professionals such as Chartered Building Surveyors, Chartered Valuation Surveyors, or Chartered Quantity Surveyors is essential.

The financial analysis demonstrates a strong positive market sentiment towards retrofitted commercial properties. All case studies showed an increase in estimated value and improved net yield, with only one showing no change in rental expectations. However, the financial viability of these projects, assessed by changes in net effect value, varied significantly. Based on the assumption of vacant properties at the time of valuation, three of the seven case studies were deemed financially viable, indicating that the increased property value could offset retrofit costs. The remaining four did not meet this threshold, suggesting that the retrofit costs exceeded the anticipated value increase.

This research underscores the intricate challenges of retrofitting commercial office stock, while demonstrating the clear financial advantages achievable through strategic upgrades. While financial incentives can bridge viability gaps, the 'do nothing' approach presents a significant risk in the evolving legislative landscape. The EPBD and CSRD are intensifying scrutiny on building sustainability, leaving owners increasingly vulnerable.

While the threat of obsolescence looms for the poorest performing buildings, even those currently above that threshold face a substantial risk of becoming stranded assets. As the market increasingly prioritises high-performing, sustainable properties – evidenced by improvements in key financial metrics – owners who fail to adapt risk being left behind, forfeiting

competitive advantage and long-term value. This report identified an effective baseline for commercial offices regarding the underlying costs and potential changes in financial metrics because of a retrofit. This report did not assess the complexity of tenant-property owner relationships, and the potential split incentives proposed by both. This warrants future research into the potential effect this can have on financing availability for commercial properties.

Another distinct challenge in retrofitting is that of protected structures, which demands a delicate balance between preserving historical integrity and enhancing energy efficiency. While retrofit costs for these buildings can be substantial, the social benefits are undeniable. Revitalising protected structures can significantly reduce vacancy and dereliction, acting as a catalyst for the regeneration of underinvested streetscapes and communities. Furthermore, corporate investment in the sustainable adaptation of older office stock sends a powerful message to clients and customers, demonstrating a commitment to heritage and environmental responsibility that extends beyond financial viability.

Policy recommendations

Grant funding should further support 'fabric first'

This study highlights that the retrofitting of buildings and their subsequently improved BER can be largely influenced by a certain limited number of measures such as the installation of more energy-efficient lighting, and installation of heat pumps, building management systems, PV panels, etc. Noting the SEAI grants available for energy audits, and the need for a 'heat loss indicator' for assessing the suitability of heat pumps, the feedback from Chartered Building Surveyors is that a more holistic approach to retrofitting is required so that the 'fabric first' principle is the priority. Many buildings, if appropriately thermally efficient in their retrofit, can enjoy decades of low energy demands compared to a 15-year lifespan of most heat pumps and other similar plant and equipment installations, for example.

Recommendation: **Review SEAI grant allocations and thresholds to encourage a greater level of 'fabric first' upgrades.**

Split incentive guidance for tenants and property owners

When discussing building performance improvements such as retrofitting, it is crucial for building owners and tenants to understand their rights and how to engage in dialogue effectively. Tenants may not always seek professional advice compared to building owners, or indeed know where to seek it, and therefore tenants need to understand what types of retrofitting work they are allowed to carry out under their lease.

There are many considerations where a building owner and tenant aim to split retrofitting costs. For example, tenants have the right to transparency regarding how retrofit costs might be included in the service charge, and property owners must ensure that service charge provisions are fair and reflect shared benefits from any improvements made. Both tenants and property owners are encouraged to engage in collaborative and early discussions. As part of the lease agreement, tenants should be given the right to propose retrofitting improvements, while property owners should consider such proposals in the context of the lease and the long-term value of the property.

Recommendation: **Lease guidance on split incentives should be developed and widely promoted to encourage an increase of building owner and tenant retrofitting collaborations. The SCSI will shortly publish its updated 'Business Leasing Code for Landlords and Tenants' to help guide stakeholders agreeing new leases.**

A pathway to retrofitting

This research analysed retrofitting costs based on vacant possession; therefore, the financial cost of business disruption was not analysed. However, not all office buildings considering retrofitting will be vacant prior to works. It is recommended that relevant State agencies develop further guidance and supports for building owners and tenants considering a pathway for retrofitting. The phasing of retrofit works can help but, in some cases, carrying out all retrofitting activities together would be more impactful in delivering more energy-efficient buildings to the market.

Recommendation: **Sectoral guidance to be developed to assist building owners and businesses/tenants.**

SEAI energy audit for SMEs data

An energy audit provides a detailed review of a business's energy needs and costs, and identifies ways to save money. The actions and the cost of energy-saving actions including their estimated retrofitting costs should be made freely available on an anonymous basis as this would provide additional valuable information to building owners and tenants, consultants and researchers. The data, if captured, could also highlight how businesses navigated the financial aspect of retrofitting, and the retrofitting decisions made.

Recommendation: **Make available aggregated and appropriately categorised energy audit data to provide tenants and property owners with key information to help build confidence with key retrofitting decisions. This could inspire other property owners to take action and accelerate market adoption of sustainable building upgrades.**

Encourage Display Energy Certificates

Several countries have successfully implemented mandatory Display Energy Certificates (DECs) to increase transparency and encourage commercial property retrofitting. In Ireland, the DEC has been mandatory for all public buildings over 1,000m^2 since 2009, providing valuable insights into energy performance and promoting efficiency improvements.

Recommendation: **Relevant stakeholders should further encourage DECs for all commercial buildings, which would enhance transparency in the real estate market, encourage saving upgrades, and help businesses and tenants to make more informed decisions about their premises. Making DECs a standard across commercial properties would create market-driven demand for better performing buildings.**

Building Information Modelling and logging retrofitted building data

Building Information Modelling (BIM) and the use of the International Construction Management Standards all play an important role in the development of a building's 'digital twin'. As commercial buildings become retrofitted with new technologies and new heat generation and ventilation plant, it is important that the information regarding the building components, installations, warranties and plant servicing requirements are all logged for future reference to ensure the optimal level of building performance.

Recommendation: **Retrofitting grant policy measures should also consider grant funding or reallocation of grant funding to support retrofitted buildings developing a 'digital twin' and encourage use of BIM for retrofit projects. BIM products can help in scheduling the retrofit projects and minimising the disruption caused to the business.**

Building Renovation Passport: certification of natural building materials

Older traditional buildings or period/protected buildings require a very delicate approach and careful retrofit specifications to ensure that the building's fabric is protected for the future. For instance, there is a need for more breathable materials to be installed to thermally improve the structure of these buildings, with careful building detailing to deal with moisture ingress issues, issues related to the building 'sweating', to avoid mould growth or poor air quality for occupants.

Recommendation: **With the frequent evolution of new building practices and new building materials to the market, it is recommended that any review to grants and other related Government supports encourage the use of more natural building materials for use in traditional and protected buildings. For example, the use of sheep wool for insulation, natural-based paints, and lime-based boards should be encouraged to help increase the availability and wider usage of tried and tested natural building products.**

Embodied carbon calculations for natural building products

In relation to synthetic and natural insulation in retrofits, policy should prioritise the assessment and reduction of embodied carbon in construction materials used for retrofitting. This can be achieved by developing clear guidelines and methodologies for calculating embodied carbon for various insulation materials, including both synthetic and natural options. This will enable informed decision-making during the material selection process.

Recommendation: **Provide incentives or supports for the use of insulation materials with lower embodied carbon footprints, such as natural insulation options, where technically feasible and cost-effective. This will align with the broader goal of decarbonising the building stock.**

Building conservation professionals for older buildings

Various construction professionals provide consultancy services to clients on their journey to retrofitting commercial property. The types of appropriate professionals can include Building Conservation Accredited Surveyors, Conservation Architects and Conservation Accredited Engineers. Building owners seeking the expertise of relevant consultants would benefit from guidance regarding the suitable professional required for their traditional building or protected structure. The Government of Ireland Guidance titled Improving Energy Efficiency in Traditional Buildings sets out practical guidance in this regard, and its wider promotion should be continued and advanced to ensure that all public sector contracting authorities and local authorities follow a consistent approach by seeking the named professions within tender competitions.

Recommendation: **Retrofitting grant guidance should include information to building owners/tenants on the appropriate conservation professionals available to them.**

Further research

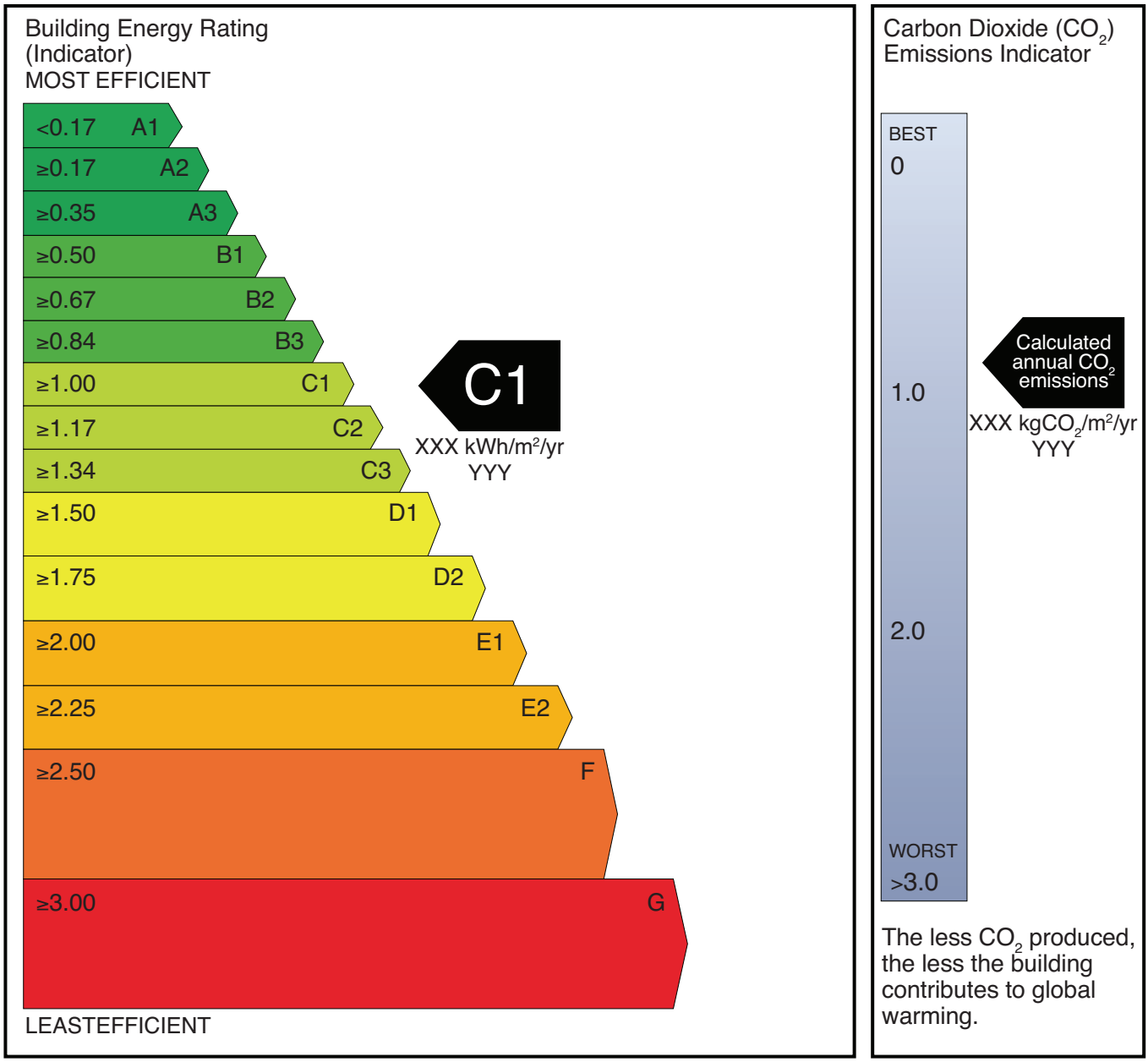
Further research would be of benefit to examine the impact of retrofitting inaction to examine the financial cost of energy-efficient buildings failing to meet the increasing energy performance of buildings requirements as set out in EU legislation on the revised Energy Performance of Buildings Directive. Such research could also examine the risk of obsolescence and the risk to tenant retention.

APPENDIX

Building Energy Certificate Ratings

Since 2007, a Building Energy Rating (or Energy Performance Certificate in EU legislation) has been mandatory for all buildings being constructed for rent or sale in Ireland. The current standards are used to quantify the energy performance of a building on a scale from A (best energy performance) to G (worst energy performance). A BER is currently valid for up to ten years, if there are no material changes to a building that could lead to significant changes in energy performance.

The current BER system identifies the primary energy use per unit of floor area (kWh/m²/year) represented on the A to G scale, and the associated carbon dioxide (CO_2) emissions in $kgCO_2/m^2/yr$.



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