

# REVALUE

THE VALUE OF ENERGY EFFICIENCY

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VALUE FROM SCIENCE AND TECHNOLOGY



The need to improve the energy efficiency of the building stock has never been greater in Europe. European housing stock is old, with only an estimated 3% being constructed to the highest energy standards; combined with low rates of building replacement, this provides an urgent need to retrofit. However, the pace at which this is happening is insufficient to meet targets. The **REVALUE** project focused on the drive for greater energy efficiency in the European residential housing stock.



“As a professional valuer of residential real estate it is essential to keep up to date with all elements that can affect the value of properties, both now and in the future.” (Sarah Sayce, RICS UK)

Recent academic work has indicated that there is indeed a link between energy efficiency levels and residential values, with more efficient stock commanding higher rents and capital values. However, these findings all come from large-scale regression studies and the role that valuers were playing was unclear. In particular, questions remained as to whether and to what extent they were investigating energy efficiency as part of their valuation process. Although their role is to reflect markets, not lead them, the standards under which they operate could be influential in helping realise the value of energy efficiency and provide some motivation to upgrade.

The REVALUE project, therefore, sought to address the relationship between energy efficiency and values in the residential sector and specifically the rented sector, which is dominated by social housing providers in Europe.

The main findings from the project relate to valuation norms and standards; the matter of data, including energy performance certificates (EPCs); and the motivations and barriers to investment policy. Among a large number of findings which have been the subject of separate papers, some key findings have emerged:

- Valuation methods are inherently flexible and can accommodate the impact of sustainability. Further guidance for valuers must be developed but no new techniques are needed.
- Energy efficiency labels do not currently play a key role in determining values in the residential rented sector but some energy characteristics, notably visual ones such as high-quality glazing, are factored in.
- EPCs have raised awareness but could be more effective if consistency and occurrence were improved.
- Although EPCs do not exert a key role in determining value, there is often limited energy data availability and where there is data available, it does not readily integrate with valuations.
- Despite this, moves to encourage investment in greater energy efficiency places a need for valuers to work with energy experts and develop greater knowledge around renewable energy sources and how they change the technology used in buildings.
- The motivation to upgrade is based on a range of factors. For social housing providers; making capital gains through ‘added value’ is not the key driver.

All these findings have implications for the valuation professional body, building owners and policymakers. The ambition to achieve a much more energy efficient stock is a journey. Progress has been made; the project has been able to explore the barriers and motivation to upgrades and found them to be complex. However, clients are becoming more aware and financiers are beginning to connect energy efficiency to their own risk ratings. But it remains the case that social housing providers are motivated, not just by financial returns on their investment, but by their mission to improve the comfort and wellbeing of their tenants and help lift them from fuel poverty.

Knowing that building attributes, rather than labels, matter more to value is important as it ties in with the due diligence processes and required skills of valuers and underscores their need to work alongside energy experts; this in turn has an impact on professional fees.

The issue of risk was important: it led to a deeper appreciation of the prospect that a ‘green premium’ achieved through energy upgrades may be a less compelling business case than the prospect of a ‘brown discount’ due to enhanced obsolescence as market demand changes. The findings, reflections and lessons learned have culminated in revised guidance to valuers specifically addressing the changing European landscape for residential values.



## PROJECT BACKGROUND

The pressing nature of climate change and the need for a response from all sectors of society and industry is widely acknowledged. The emphasis previously has been on mitigation; now, there is recognition that this alone will not be enough: adaptation is required. Even before the 2015 Paris Climate conference (COP21), which set the stage for stronger concerted governmental action, the issue was of considerable concern within the EU member states. It was also acknowledged that the climate change agenda had a very strong tie to the built environment. Climate change means that demand for energy to heat and cool property will increase unless action is taken to increase the efficiency of the stock; furthermore, any supply issues will raise prices and fall hardest on those with poor purchasing power; leading to negative health outcomes, continued fuel poverty and, in the worst cases, fatalities.

Therefore, the need for energy efficiency has never been greater. However, Europe's housing stock is old and energy inefficient; the Buildings Performance Institute Europe (BPIE) estimate that only 3% of stock is constructed or improved to the highest energy standards (BPIE, 2017). The World Green Building Council (WGBC) found that the energy efficiency of stock correlates closely to its age; and rented stock is likely to have a lower efficiency than owner-occupied stock. As most energy is still derived from fossil fuels, residential emissions account for a large percentage of carbon emissions.



In addition, the replacement rate of stock is very low, seldom exceeding 1% per annum and less in periods of economic slowdown (see Balaras et al. 2007). It was argued that faster speed and depth of upgrade is required (Artola et al. 2016). There is a connection between building age and efficiency: residential stock across Europe tends to be old, particularly units that lie in the rented sector. The issue has been to support the case for investment in energy efficiency, by new build or renovation.

Even before this was very firmly endorsed by the 2018 IPCC (Intergovernmental Panel on Climate Change), the EU supported a range of projects aimed at helping market transformation towards a more energy efficient stock. The H2020-funded REVALUE project is one such example. It addressed the residential sector and specifically the rented sector, which in Europe is dominated by social housing providers. Therefore, the project had a focus on social housing provision but nevertheless also addressed the private rented sector and owner-occupation in some aspects of its work.

Fundamental to the project was a consideration of the current and potential role of the valuer and of the content of their valuations in helping to address the need to upgrade property for greater energy efficiency. The main reasons for commissioning valuations are: sale / purchase; secured lending; investment monitoring / decision making and entry into company accounts. For each, valuation professionals will be mandated to work within the requirements of the RICS - Global Valuation Standards (also known as 'The Red Book') but, with adherence to national variations, where appropriate. For most purposes the basis of valuation will be market value or, for investment decisions, investment value (worth).

In undertaking any market value instruction, the valuer's role is to reflect the market – not to influence it. Therefore, if they do consider the energy efficiency of a property, it is only to the extent that it is an identifiable value driver. The challenge to the valuer is how to analyse the impact of energy against the factors that drive market buying behaviours, using evidence of comparable transactions. This will be a challenge when valuing within a context in which the evidence is primarily derived from owner-occupation sales.

However, where they are preparing a calculation of investment value on behalf of a specific client, the importance of energy efficiency factors will be factored in to any Discounted Cash Flow (DCF) prepared. To an investor, the future impact on rent and capital value of energy efficiency and pricing may be a consideration, particularly if this will impact on the value risk profile of the asset. Lenders too may be concerned regarding the future security of the loan.

In conducting their work, valuers are bound by the standards issued by their professional body. For the purposes of this project the relevant body is RICS (Royal Institution of Chartered Surveyors). RICS also provides additional guidance which is not mandatory but advised. At the start of the project there was an advisory reference to collecting sustainability data contained in the standards but the only additional advice specifically for residential valuations was focused on UK markets and had been archived as it was deemed to be out of date. Whilst there were many publications issued by RICS relating to sustainability and the built environment generally, there was no specific European-level valuation guidance.

The project ran for an extended period from 2015 until 2019 and utilised a number of research methods; it also sought to interface not only with some other projects working in similar areas but with the key stakeholder groups whose actions are instrumental – or could be – in helping achieve the ambition of a far more energy efficient residential rented stock in Europe.

This report does not attempt to detail all the project results; instead it seeks to synthesise the major elements of the work into a set of findings. It goes on to detail the implications of these findings for the main stakeholder groups. Finally, it presents a reflection on the 'journey' the research team have undertaken over the period of the project and draws some overarching conclusions.

## AIMS & OBJECTIVES

The stated aim of REVALUE was “**to lead the development of appraisal norms and standards that recognise the value of energy efficiency in social and private residential real estate.**”

The background to this ambition lay in three main drivers. First, the strong policy commitment across the EU towards meeting energy targets, both through energy transformation to fossil-free fuels and through a reduction in energy use. Second, the recognition that the building stock must be improved to become more energy efficient as indicated in the introduction. Finally, the hypothesis that the valuation profession had a key role to play in supporting the market transformation by integrating the impact of value changes arising from energy upgrades. It therefore pre-supposed that energy retrofits would lead to value increases, but that valuers had not adjusted their methods to account for this.

This was all driven by the belief that one of the reasons there wasn't enough investment in greater energy efficiency levels was because the business case for such investments was not strong enough. This was linked to a failure of improvements to be adequately recognised within capital value uplift consequent on the work.

Prior to the start of the project, some academic work indicated that buildings with a higher energy efficiency rating were commanding higher values (for example, Brounen and Kok, 2011; Amecke, 2012; Hyland et al. 2013; Cajias and Piazzolo, 2013). However, there was a concern that the practices and standards by which valuers operated did not adequately

recognise the uplift value of energy efficiency. This project therefore set out to understand better the role of the valuer within the creation and articulation of the business case, potentially through financial rental, or capital gain. It was important that RICS, the leading professional body to which valuers belong, was part of the consortium.

In setting the aim to explore the norms and standards by which valuers operate, the REVALUE team recognised that valuations normally underpin many real estate decisions, be these decisions for purchase/sale, development or management decisions. Importantly, valuations are normally relied upon for lending decisions where capital injection or purchase is considered. There was, therefore, an implicit assumption that valuations did not, at the time, adequately recognise the value of energy efficiency. Even if they did, there was uncertainty about whether or not it would prove an incentive to invest. The argument was initially made that, whilst professional guidance to valuers was enough to allow valuers to build in valuation impacts of energy efficiency, there was no obligation,

or indeed instruction how to do so. The implication of this, it was argued, was that barriers existed to realising the benefit of energy efficiency improvements which in turn, locked up capital which could be released resulting in financial and energy saving gains.

Therefore, the key endeavour was to develop a deeper understanding of the relationship between value and energy efficiency and support the development of clearer guidance for valuers so they could better understand any links exposed during the research.

The key objectives, in essence, were to:

- work with RICS as the leading professional body for valuers with a view to developing their norms and standards to assist valuers in building in due recognition of energy efficiency;
- in the light of these developing norms, to test against some pilot portfolios of social housing providers; and
- work with stakeholder groups with a view to gaining their support for changes which would facilitate more engagement with energy efficiency

### *On the forefront of sustainability research*

Maastricht University's European Center for Corporate Engagement has been among the world's leading institutions researching the economic and financial aspects of sustainability. Especially in real estate sustainability and energy efficiency, the center has gained a top reputation as a research pioneer, producing work that has influenced academics and practitioners. This has helped decision making of real estate investors and developers all over the world, both in commercial real estate and in affordable - housing.

Over the years, our work has been helped tremendously by cooperation with key players in the European real estate sphere, and especially in the REVALUE project, in which we've had the great pleasure to work together with premier institutions like the RICS, Savills, Luwoge Consult, Vanhier MKB, and of course, Bax & Company, the project leader.

This cooperation has brought forward a deeper insight into the extent to which property valuers should incorporate sustainability performance in their valuations of affordable rental dwellings, but also into the ways they already do so. This is essential for affordable housing institutions all over Europe, and will help them make informed decisions regarding the sustainability and energy efficiency of their assets.



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investments.

A key part of the delivery of these objectives was dependent on working with the chosen professional body. It was identified that RICS, the only truly global valuation professional body, was critical to successful delivery. Although there are many valuation professional bodies, RICS has not only the largest number of members, but also the greatest regulatory control over them. What's more, RICS is a core member of the International Valuation Standards Council (IVSC) and works to develop standards which it then places into a regulatory framework that qualified valuers must adhere to. Importantly, whilst the framework (known as the Red Book) sets down the global processes and valuation consideration, RICS produces practice guidance (Guidance Notes) and research papers (Insight Papers) which support valuers' understanding of best and emerging practices respectively.

To achieve REVALUE's objectives it was recognised that the team needed to interface, with a range of stakeholder clients who instruct valuers, as well as the valuers themselves. The role of the valuer has always been recognised as one in which they work to clients' instructions. During the early stages of the project, it was confirmed that in most cases, valuers across a range of European countries (Michl et al., 2016) were seldom instructed to consider energy or indeed any other factors related to the sustainability agenda.

Therefore, the project team worked closely with clients and RICS, to help support a trajectory towards closer understanding and integration of energy efficiency within the valuation process.

The overall intention was that the outputs to the project would:

- reduce uncertainty by adding clarity to valuation norms and standards by enabling a link to be made between energy efficiency and value;
- increase investor confidence by allowing banks and investors to realise value gains by the recognition of energy efficiency in the book value of their portfolios;
- enhance trust in valuation by mandated standards that are acceptable to the market; clarify the link between energy certification and value;

It is against these outputs that the work has been directed and the results will be discussed.

## WORKING METHODS

The project was designed as a series of work packages, collectively supporting changes in the way in which valuers undertake their work and better enabling them to reflect energy efficiency within the valuation of residential stock.

Firstly, it was considered important to actually review the 'state of play' in terms of the standards and norms adopted (this was undertaken in Work Package 1 (WP1). WP2 aimed to develop the data required at the building level, to enable energy efficiency to be appropriately recognised and applied in case studies to test its validity. This was to be done via analysis of a typology of building types and tested against the availability of building owner data. WP3 was designed to test the relationship that could be observed between value and EE by use of quantitative techniques. Finally, WP4 was providing recommendations to the valuation profession for embedding the findings.

Inevitably, as the work progressed, adjustments to the working methods were needed. In particular a major finding in WP2 that the anticipated, detailed, data sets - originally envisaged for integration into valuation practice - were simply not available to most building owners or valuers. Consequently, the work effort shifted to the investigation, via qualitative measures, of the views of stakeholder groups. The series of interviews, roundtables and in-depth discussions with selected portfolio owners yielded the basis for much fruitful discussion among the team leading to a series of key findings related to both the role of valuation and the motivations of stakeholders. These findings have been key to successfully achieving the REVALUE objectives.

Alongside this work, a major quantitative study of selected social housing providers, aimed at examining the link between reported values with not just certification, but data points was carried out. Whilst many studies already existed (e.g. Brounen and Kok, 2011; Fuerst et al 2015) which related rental or capital values to EPC labels, this work was unique in two ways. Firstly, it was based on the book values (rather than transaction prices) of actual social housing portfolios. Secondly, it went beyond energy labels to examine the links to specific building characteristics. It also, uniquely, compared two valuation periods so that it could be established if energy efficiency had gained in value importance over a five-year period during which the reliability of EPCs had been thought to have improved. This output (D3.3 Energy performance and valuation of social housing in Europe: a quantitative analysis) yielded critically important findings and enabled a greater explanation and depth of understanding of the relationship between reported values, energy labels and energy efficiency characteristics of buildings. Finally, during the REVALUE project, a series of case studies were undertaken to develop a full understanding of how the REVALUE findings can help social housing providers develop their investment strategies (D2.3 and D2.6).

The REVALUE ambition to deliver recommendations to the professional body for enhanced standards and guidance has been, in effect, an ongoing engagement with and by RICS. As a result of these dialogues and collaboration, REVALUE has not only been able to feed changes into the global Red Book but also into a focused Insight Paper, summarising research and recommendations to valuers across Europe in relation to undertaking residential valuations.

There were some considerable challenges to the methodology, which were overcome through internal dialogue and adapting the work undertaken to produce findings which have been described as comprehensive, and, in the words of one very senior valuer, they “will assist valuers in understanding the potential impact on value and/or liquidity of energy efficient residential buildings”.

## MAIN FINDINGS & THEIR IMPLICATIONS FOR STAKEHOLDERS

The main findings from the project are now grouped under the following headings. For each of these, the key findings are explained and their relevance for the impacted stakeholder groups is set out.

- Valuation norms and standards
- Data, including EPCs
- Investment policy: motivation and barriers

As a professional valuer of residential real estate it is essential to keep up to date with all elements that can affect the value of properties, now and in the future. The REVALUE project offered Savills the opportunity to further investigate the effect Energy Efficiency has on values. The project offered the opportunity to speak to other stakeholders (financiers, landlords, energy consultants, etc.) and to get a feel for potential new trends.

Improving Energy Efficiency is one of those things that comes across as the right thing to do. That is however not enough to amend values. We need solid market evidence that Energy Efficiency does influence prices before this can be reflected in valuations. The REVALUE project has generated a wealth of data that can contribute to make the impact of Energy Efficiency more transparent. In the latest 2017 RICS Red Book, there is more focus on sustainability and Energy Efficiency is a topic that our valuers need to follow closely.



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Head of Housing  
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## Valuation norms & standards

### Valuation methods are inherently flexible and can accommodate the impact of sustainability

The review of valuation standards, norms and policies confirmed that valuations are conducted using a number of different methodologies depending on the purpose for which the valuation is being produced. For the majority of cases, for example, purchase/sale, secured lending and some 'book' valuations, the method used relates to an analysis of comparable sales or rental evidence to establish a market value. Within this method, the valuer must assess the factors that influence value and translate the evidence from comparable transactions to the property under consideration. There is nothing in the method to either prevent or require the valuer to 'de-compose' the evidence to isolate any specific item such as energy efficiency; it is up to the valuer's judgement. With their knowledge of market participant behaviour, the valuer is an interpreter of data. If they do not witness any reflection in transaction prices as a result of different energy efficiency profiles, they will not reflect it in their valuations; where they do, they should adjust their assessment of market analysis accordingly. At the start of the project, there was a belief that energy efficiency was not feeding into the analysis process, despite academic evidence that, at the macro level, it was. But the method itself was not found to be a fundamental barrier; indeed, interviews with valuers confirmed that they were aware of the need for enhanced energy efficiency but didn't see it as a motivation for purchasers or tenants.

Further, the findings from discussions with the major client base consulted (housing providers) revealed that valuers to housing providers are increasingly utilising DCF (discounted cash flow) approaches when undertaking 'book' valuations for the accounts. These better enable the valuer to specifically take account of EE as long as the client holds the appropriate data. This can be factored in either through adjustment to the actual cash flow (if the landlord pays for energy or the rent can be adjusted to reflect the level of energy efficiency), through the inclusion of specific cash flow injections to upgrade, or through the discount rate applied to reflect any perceived risk to value moving forward. However, a caveat to this is that in relation to much of the European social housing provisions, statutory and regulatory requirements may impose rent 'caps' which restrict the right of landlords to reflect investment in rents charged and hence the cash flows feeding in to valuations. It was therefore found that valuation of social housing portfolios is prepared using adapted methods which result in reported figures below market value.

Overall, the finding in relation to valuation methods, established through the literature, interaction with the profession and interviews, is that the full range of methods approved and used can accommodate integration of energy efficiency providing the valuer has the data to support this and the skills/knowledge base both to recognise, through inspection, the general level of efficiency displayed by the dwelling and any supporting evidence and to feed this through to their analysis.

### Implications:

- Valuers: for RICS, it means that there is no need to develop new models or techniques; instead the requirement is to help their valuer members to develop the evidence database and integrate this with upskilling as required. This has already taken place by strengthening of process guidance in the Red Book (2017[a]) towards data collection and risk reporting and the publication of an Insight Paper - *Energy Efficiency and Residential values: A Changing European Landscape*. During the life of the project, RICS published online training materials (Renovalue) which is a free training package to valuers. These materials are being updated and a section within the training relating specifically to residential valuation will be developed as part of the dissemination of the project. The further implication for the professional body is to work with various agencies and the valuation client base to ensure that data collection is enhanced through good asset management practices.
- Clients: it is important that when commissioning valuations they both instruct valuers to consider energy efficiency and to, where possible, collect and provide energy data. Where clients are portfolio landlords, it is important that they enhance asset management practices so that the data needed to underpin valuations is available.
- Policymakers: the implication is that there is a need to recognise that restrictions on rents chargeable may present a dis-incentive to social landlords to undertake energy improvements as they are difficult to reflect in subsequent portfolio valuations.

### Energy efficiency labels do not currently play a key role in determining values in the residential rented sector, but some energy characteristics are factored in.

One of the key ambitions of REVALUE was that its outputs would, or could, lead to value differentiation based on levels of energy efficiency. This proved not to be the case when tested both quantitatively and qualitatively. The large scale regression analysis found that, whilst it was possible to discern a relationship between EPC labels and reported valuations of a sample of large social housing portfolios in the UK and the Netherlands, and that this relationship had, at least in the case of one city strengthened over time, it was not significant in terms of total reported values (see figure 1). Overall, traditional value 'drivers' still exerted the most influence on value (figure 2).

These findings were corroborated by the findings from a series of roundtables in which valuers generally maintained that EPC labels, even where available, were not a key factor affecting the behaviour of market participants (Deliverable 2.4).

However, what was perhaps less expected, was that, whilst EPC labels did not generally impact value, some of the building characteristics which can improve energy efficiency, did. Both the quantitative study and the qualitative research pointed to easily recognisable visual elements, such as windows (glazing and frames) and doors having measurable positive value implications.



Figure 3 presents the finding from the quantitative study, showing that, for example, windows and glazing, had an impact on value that was significantly in excess of the impact of EPCs.

Less 'visual' elements were not found to have the same value impact. One explanation for this is that buyers and tenants often make decisions and place bid prices based on very limited inspections; valuers have neither the time within their instruction constraints, nor in some cases, the skills, to assess energy implications of some less obvious features such as a boiler's age or particular brand. This skills and knowledge issue varied depending on the educational background and training of the valuer. Whilst all have a 'base line' knowledge, in general there is limited core training in energy efficiency or building services.

Implications:

- Valuers: RICS acknowledged that the current knowledge of valuers to recognise and evaluate energy efficiency factors within buildings may be limited. This has a training implication which will be addressed in part through adaptation of the online training RenoValue and other

CPD programmes. It may mean that valuers should be trained further on the impact of various building components that can affect energy efficiency and not rely solely on the EPC; alternatively, they should work alongside energy assessors.

- Clients: If valuers are to undertake more due diligence in collecting and analysing energy data, or work with energy assessors, there will be an impact on fees. Commissioning clients may wish to consider how they can assist with making data readily available to their valuers.

The moves towards encouraging greater energy efficiency places a need for valuers to work with energy experts or develop greater knowledge around renewable energy sources and how they change the technology used in buildings.

Interviews conducted with valuers across four countries and their clients confirmed that a valuation is neither a building survey nor an energy audit, although as reported above, there is an expectation that valuers should have a basic knowledge. Not only do valuers generally not have the skills and training to undertake full surveys or energy audits, the fee basis generally agreed would preclude the level

of work required to do so. However, given the growing importance of both recognising and assessing the contribution to energy performance of structural and service characteristics, it is critical that the valuer has contextual knowledge. What was also found was that the educational background of valuers tended to vary from country to country; for example, in Spain, and to a lesser extent Germany, many valuers came from an engineering background with a good knowledge of building physics; however, in the UK and Netherlands, an economic or business background was more common. Whilst all have been through rigorous valuation education, a requirement for additional training for valuers to deal with an increasing range of energy matters may be required for many valuers. As the quality and quantity of data improves, a more 'forensic' examination of characteristics will be required, leading to a need perhaps for integrated professional services. This of course would have a fee impact, which may be challenging for clients unless they rely on the outputs of the report.

Implications:

- Valuers: for RICS, it means that valuers should be encouraged, where possible, to work alongside

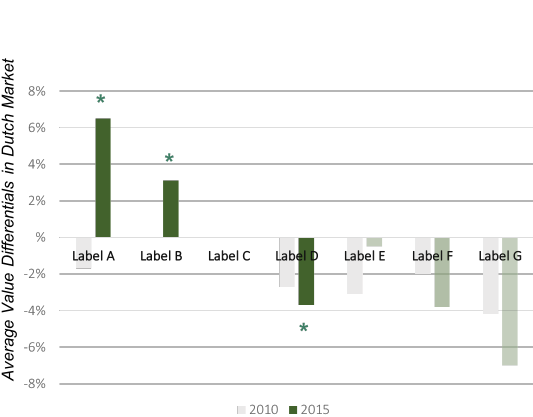


Figure 1 Estimated value differentials for the Dutch sample. The reference or comparison group is C label dwellings

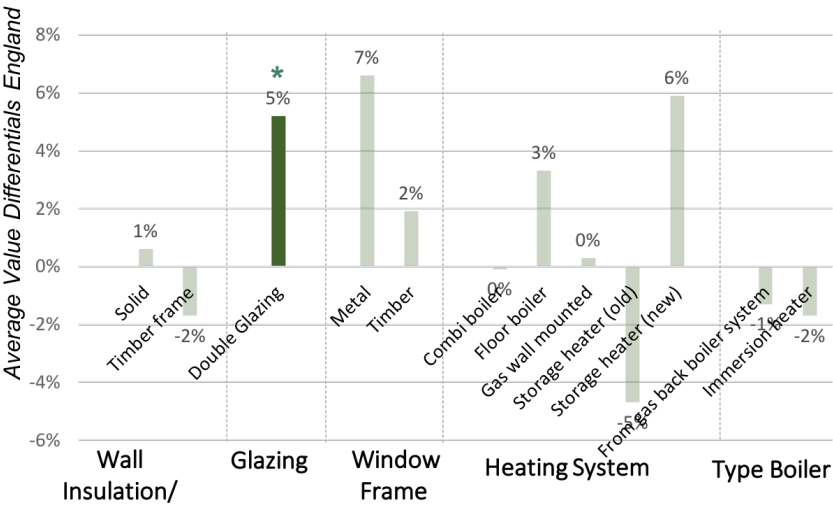


Figure 2 Average Value Differential - Component Level



energy experts so that they can better evaluate how the various building components that can affect energy efficiency can be integrated in their valuations, especially those conducted using DCF techniques. Additional training would be beneficial. There is currently a developing 'PropTech' sector and by implication, these professionals will be key to forming the link between technologists and valuers.

- Clients: if the matter of energy assessments leads to the requirement of extra levels of due diligence or the involvement of energy specialists, there will be a fee cost implication for clients; however, the upside is that they will be better informed, and this can lead to more appropriate decision-making.
- Policymakers: the increasing integration of valuation with the work of technologists is important; by implication the encouragement of projects which enable technologists and valuers better to understand the work that each do respectively with a view to developing effective collaborative ways of working could be instrumental in supporting policy objectives of reducing energy use in buildings.

## Data, including EPCs

### Energy Data availability is limited and does not readily integrate with valuations

Underpinning the initial work of REVALUE was an expectation that data was collected by building owners, and that, if passed on to valuers, it could (and should) be incorporated in valuation practice. Early explorations uncovered a lack of good benchmarking data as to what constituted an 'energy efficient' building, particularly as the majority of stock is old and there are many typologies. Put simply, the data to enable building owners to make sound investment decisions and benchmark buildings is often not in existence. Therefore, one strand of work was to develop a prototype tool to establish how energy efficiency for any type of residential unit could be modelled, quantified and built into a life cycle analysis as an input to a DCF-based valuation. However, whilst a prototype tool was developed, when discussed with valuers and clients, it proved to be unworkable in an accessible and scalable form. Put simply, the data that was held by building owners is currently insufficient to allow of the use of such a detailed model. Further, the level of time and expertise to apply the model would not be economically viable.



What did emerge from discussions within the team, within stakeholder groups and through the detailed case studies of individual social housing portfolios, was that data availability and consistency was an issue. Indeed, it transpired that there were very few data points that were held by all the providers who took part in the study; from an energy viewpoint, there was not even complete coverage of units by EPCs although this was the most common metric. This finding supported the initial view that good benchmarking data was missing; without it, valuers lack the evidence to systematically undertake analysis using energy efficiency as a variable.

The issue surrounding the lack of data was raised in interviews with building owners; they were also asked whether they were aware of moves by the Global Alliance for Buildings and Construction (GlobalABC) to develop a 'building passport' which it was hoped could overcome some of the data issues. Very few people had heard of it – but there was considerable interest in the idea of such a concept, once it had been explained.

### Implications:

- Valuers: the data relates to the market evidence that valuers work with; this is widely, but not universally, understood. The profession is taking steps to educate and train valuers to support moves towards greater sustainability; for this they need data. By working with commissioning clients, recording data as it becomes available, as required under the Red Book and by developing their own knowledge of the important energy related building characteristics, they will be better enabled to assess value risk profiles. Therefore, they would be better enabled to 'nudge' clients towards better data collection which can feed through to the assessment of value.
- Clients: quite aside from any matter of valuation, good asset management requires good data. Whilst there was acknowledgement of a desire to improve their records and a strong move towards this, more needs to be done. This finding feeds through to the building passport project which is now underway, and in which RICS is a lead player. If this project succeeds, it will help to overcome some of the data issues but in the meantime, the need to improve continues.
- Policymakers: EPCs are likely to remain the prime metric and thus will be integral to the conversation for many years; Therefore, it is important to ensure, as far as possible, that more buildings not only have EPCs but ones that are up to date and of sufficient quality for stakeholder to place confidence in them.

**Energy Performance Certificates have raised awareness but could be more effective if consistency and ocurrence were improved.**

An expected finding was that EPCs are the only commonly available metric. However, despite being widely available, they were not found to be necessarily useful in terms of planning investments, informing value judgements or providing an accurate assessment of energy efficiency. They are not developed using uniform method; sometimes the methodology even varies across single member states. Furthermore, in some jurisdictions, EPCs, particularly those commissioned prior to 2012, were often reported as not trusted by valuers. This may sound like a very negative outlook; it is not, as explained below.

EPCs are the only metric that has achieved deep penetration and is widely collected. Several of the companies interviewed have almost complete EPC records for their portfolios. As EPCs are not required except at letting or sales trigger, this pointed to some landlords with long-term hold portfolios commissioning voluntary certificates. Even if imperfect, they are a benchmark and one that has been widely adopted as a surrogate measure to assess the relationship with transaction prices. They are also credited with raising awareness, with all stakeholder groups, having at least some knowledge of them.

From a wider perspective, interviews with financiers and with building owners revealed that the EPC is not widely used within financing decisions, although we did find that it might matter in some marginal cases. However, as other projects have found, this situation is changing rapidly, and it was found that financiers expressed the opinion that they would find information that could be related back to running costs and default risks useful – but it is the actual costs that are more important in relating to the risk of the loan rather than the label.

As data points, EPCs undoubtedly have a role, but for them to really influence decision-making and be reflected in values, the view of most stakeholder groups was that their accuracy, ocurrence and methodology need improvement.

**Implications:**

- **Valuers:** Valuers should be aware of the limitations of EPCs and also ensure that they do not place reliance on older certificates when a property may have undergone change. When carrying out a valuation, it is important that they verify the data.
- **Building owners:** As EPCs are important in terms of market perception and provide what is probably the only real energy benchmark, portfolio owners are advised to ensure that they hold updated certificates so that appropriate management plans can be put in place; however, EPCs should be seen only as one part of the movement to develop better energy information. However, in making upgrade decisions, owners need to be aware that it was reported that some upgrade technology may make buildings more expensive and difficult to manage.
- **Financiers:** As revealed through REVALUE and other projects, vanguard financiers are beginning to view lending through the lens of energy efficiency: an energy efficient dwelling should be cheaper to run and may make lending default less likely; crucially, for financiers the link to credit risk is important. Requiring, within their standard instructions, information about EPCs and, eventually, other energy consumption factors, would allow more accurate risk profiling.
- **Policymakers:** it is critical that EPCs are truly fit for purpose. Judging by the findings from this project, there is scope to review the methodology to make it more consistent in application, to enhance training levels of assessors and ensure that more buildings not only have EPCs but ones that are up to date. This latter point is important. Currently EPCs last for ten years and any analysis based on a very old certification may lack robustness.

**Investment policy: motivation and barriers****The motivation to upgrade is based on a range of factors. For social housing providers, making capital gains through ‘added value’ is not the key driver**

Throughout the project, the REVALUE team explored the motivations for investment in energy improvements on the part of residential portfolio owners. From a starting hypothesis that return on capital was the main driver, the research led to a more complex set of findings. These must be placed in the context that the case studies examined and interviews with portfolio owners were primarily within the social housing sector. Whilst some contact was achieved with private sector landlords, most of these are either institutional style investors or funds, who invest in new or newly renovated stock developed specifically for renting. This sub-sector has witnessed much growth within the last few years but is not where the focus of REVALUE lay. Approaching small-scale private sector landlords was not within the originally planned method and would not have been feasible. Small-scale investors, though very large in number, are not a homogeneous group and many own only a few dwellings. They are therefore a ‘hard to reach’ set of stakeholders.

For this reason, the project concentrated on the owners of social housing portfolios (Deliverables 2.5; 2.6). To this group of stakeholders, the motivation for energy investment lies primarily in their social responsibility, rather than profit margins. In many cases, this is linked to the health and well-being agenda. This theme cropped up repeatedly throughout the research (Deliverable 2.5). However, capital spend is a general issue; the rent capping and constraints on capital spend that are imposed in some jurisdictions can be very real barriers to investment. For social housing providers, it is important to work cooperatively with their tenants and, in part, this dictates that energy improvements only take place as part of planned, holistic, retrofits.



None of this means that social housing providers do not work to business plans: they do. But the criteria for spending is more on 'soft' indicators. Qualitative measures such as tenant satisfaction survey results, reducing fuel poverty, lowering default rates and reducing void periods are as important as capital enhancement and rental increases, even where these are allowed. However, there was a general acknowledgement that greater knowledge of tenants' energy consumption patterns would allow for improved decision-making in terms of upgrade work. It was therefore recommended in case studies (deliverable D2.3 and D2.6) that housing providers collect more comprehensive data on their stock. This will allow them to move to more quantitative decision-making without abandoning their qualitative indicators.

The source of funding for investments is varied, with much spending coming from internal sources; where borrowing takes place, the arrangement is based on the financial status of the company rather than the value of individual property assets. While real estate valuations do underpin the company's financial position, the driver is the whole business position and the commitment to corporate responsibility principles.

It follows from this that we found that valuations do not drive decisions: they are required, but often do not play as active a role as had been originally anticipated. However, it was also found that cash flow analysis was increasingly important both for management purposes and for financing. Where cash flow analysis lies behind reported values, the links to business efficiency and savings to go towards planned retrofits is an aid to decision-making.

#### Implications:

- Social housing providers: in order to inform investment decisions to retrofit, it is understood that a holistic view of criteria is taken; however better data collection and asset management records might enable the investment case to be made more explicit.
- Valuers: the use of DCF models, rather than traditional methods of establishing value, better enable valuers to reflect how matters such as voids, etc can be reflected. Whilst DCF is not appropriate within the owner-occupation sector, greater use within the rented sector is to be encouraged; this has a training implication.
- Policymakers: there is a need to understand that for many residential stakeholders, especially social landlords and owner-occupiers, the decision to invest in energy retrofitting work lies not only in financial criteria and the availability of money. Occupiers' satisfaction and comfort and revenue savings are also important. Better understanding the mix of motivations to upgrade, could help influence the design of initiatives aimed at improving rates of retrofit.

## LESSONS LEARNED & REFLECTIONS

The REVALUE project presented challenges for the team. For example, the finding that data points were far less consistent than had been anticipated led to a need to adapt working methods as the project progressed. Nonetheless, the challenges promoted deep discussion within the team and the resultant adaptive and flexible approach has proved fruitful. Perhaps the single most important lesson is that all stakeholders are 'on a journey'. Further, the project has been instrumental in providing resources which has enabled RICS to develop guidance and insight to its members. Finally, it has also helped and challenged social housing providers to think in a different way about their future plans for making their portfolios more sustainable.

Below, we reflect on some of the learning and achievements of the project. Collectively these present a positive picture and point a direction of travel for the journey REVALUE team have followed so far:

#### *Client instructions and a changing market context*

The role of the client is critical to the work of valuers. Towards the beginning of the project, a paper by Michl et al. (2016) confirmed that in many cases, clients were not asking valuers to comment on sustainability factors, although valuers were already collecting a lot of relevant data points when available. However, these were not explicitly reported. The project has shown clients that by both generating and asking for comment about energy efficiency and related factors, they can help raise awareness; this is a precursor to market change. Over the project period, the team witnessed greater exposure through all media channels of the importance of climate change. Whilst this is subliminal messaging, the clear policy messaging and in some cases regulation around energy efficiency has led to an observation, untested, that energy retrofitting is far higher up the agenda in the property markets than assumed.

At the start of the project, financiers were identified as essential stakeholders, but there was little knowledge as to whether they were taking account of energy matters within their lending policies; indeed, the consensus was that they were not. However, the team found that, by the end of the project, evidence was emerging that some financiers were beginning to take interest in energy matters. This was explored on two levels in the REVALUE project through a roundtable of financiers and interviews (deliverable D3.1):

- occupational costs related to ability to pay. This was explored in the UK-based Lenders project in which banks who lend to owner-occupiers were concerned with their ability to pay; thus, they concluded that a buyer of a unit that has lower energy bills and lower overall household costs, due to high levels of energy efficiency may be a less risky borrower. These findings were



supported through REVALUE.

- prospects of lower risk and added value. Green mortgages aimed at providing discounted mortgages for both energy efficient stock and for upgrade projects are now being developed through the EeMAP project and other bank initiatives.

These represent important steps that may impact market values; however, these initiatives are geared to individual lending, not corporate lending; for which different approaches may prevail.

These are all positive developments. There has been less progress in relation to valuer fees. A detailed consideration of energy matters and value requires more inspection time and possibly the instruction of other technical experts to work alongside the valuer. This issue appears as yet unresolved, but at least it is more clearly recognised.

### **Valuations: an improving data landscape**

The standards and norms in relation to valuation were extensively debated, discussed and reviewed. What we distilled from the discussions was that, whilst norms and standards can – and are – set and revised, these have a primary purpose of ensuring consistency of process, rather than method, the choice of which is down to the valuer (Red Book, 2017) where appropriate.

For almost thirty years, Bax & Company has built intersections between innovations and research, and industry and business to bring solutions to the ever-complex problems faced by modern society.

The challenge, brought about by the project, was to explore how energy efficiency could affect the value of residential properties. To do so, we are proud to have worked with Savills, RICS, Maastricht University, Luwoge Consult and Vanhier MKB Accountants to pool knowledge, research efforts and results.

What really attracted Bax & Company to REVALUE was the opportunity to work side by side with valuers, assets owners, researchers and other experts – connecting otherwise siloed entities – and uncover evidence from big data analysis and industry experts, to create novel insights. We are proud to have participated in collaboration that has provided a 360 degree view on this issue and that delivers enhanced valuation guidance.

Enhanced formal recognition of Energy Efficiency and the enthusiasm towards it, shown within the project, have built strong foundations to how to better inform investment decisions in energy efficiency measures. Trusting on the value of energy efficiency, this could over time add value to properties and would really put us a step closer to European energy targets.



**Rolf Bastiaanssen**  
Partner  
Bax & Company

The result of the discussions has been that, intrinsically, all valuation methods are capable of being applied to include greater specificity regarding energy efficiency. That valuers do not generally explicitly consider energy efficiency is partly market-driven. It is hard to analyse deals undertaken on a range of criteria to extrapolate one factor. Whilst the influence of energy efficiency can be extracted successfully (as it was in this project) at a macro level through the use of multiple regression models, these models cannot be applied at the individual building level.

For the individual building, including energy efficiency explicitly into valuations is data-dependent. A vital discussion point once it was revealed that, the data paucity issue was larger than anticipated. However, this finding is not restricted to REVALUE; indeed, RICS published an Insight Paper in 2017 relating to data availability on a global scale (RICS [b], 2017). The findings of which reflect the findings of REVALUE. However, much is now changing and since the start of REVALUE, various initiatives have commenced which collectively are likely to transform the data landscape and thus enable valuers better to integrate matters relating to energy efficiency and the wider sustainability agenda into their valuations.

Notable among these initiatives are the Building Passport project launched by the Global Alliance for Building and Construction (Global ABC) and the EeMAP (Energy Efficient Mortgage Action Plan). Members of REVALUE are involved with both, acting within the RICS remit.

Knowledge of the Building Passport proposal was explored through REVALUE interviews and whilst interviewees had little or no knowledge of it, they were supportive and could see how this would

aid transparency to valuations. Together with the further development of Automated Valuation Models (AVM) which can incorporate a wider range of data, these are positive steps to further integrate energy efficiency.

There have also been steps taken in some EU member states, to review and enhance EPCs; as the only common metric and one with which all stakeholders engage, these moves are welcome. Whilst REVALUE cannot claim to have been instrumental in this, the empirical findings might be different if replicated once EPCs have been reviewed.

### **Energy efficiency is factored in by recognition of building attributes**

The REVALUE team had to explore the discrepancy between the findings from academic papers which have long maintained that higher energy efficiency results in higher rents and sales prices, and practicing valuers who have maintained that EPC labels do not impact residential values. Who was right? Could there be a reconciliation of views? The comprehensive reviews of literature did not provide an answer. Not only did residential studies such as Hyland et al. (2013) imply that valuers were failing to pick up on an apparent relationship between energy labels and values, other literature implied that the barrier was perhaps the valuer (Warren-Myers, 2013).



One way REVALUE shone a light on this discussion was through the regression study which sought not only to analyse the impact of the energy label but also to assess the impact of individual building attributes which are associated with energy efficiency and which valuers had indicated were value drivers. By so doing, it became apparent that, at least for the social housing providers included in the study, it is the visual physical attributes that have a stronger observable relationship with reported values than energy labels. This was confirmed through the discussions with valuers who pointed out that physical building characteristics related to energy efficiency (e.g. high-quality double/triple glazing) can enhance value – but sometimes for reasons other than efficiency gains (enhanced visual appeal, greater comfort and higher levels of security against intrusion, etc.). All this is helpful to the debate. It can inform the real estate owner's decisions in terms of which improvements to either invest in to yield the best value increases or protect from value decline. The findings from REVALUE in this area are feeding into the EeMAP project, an output of which is a valuer checklist which aims to enable valuers to inform lenders regarding the value risks relating to energy efficiency, enabling them to build in the rewards associated with energy retrofits into the costs of borrowing. It is hoped that this key learning will be picked up and integrated in future empirical work.

#### **Skills and training of valuers**

The premise of REVALUE was that by reviewing and updating the standards and norms which apply to valuers, energy efficiency could be better reflected in reported values. The project findings were that data and evidence on which to form professional judgements were bigger barriers than the methods employed by valuers; there was therefore no requirement to change the basic approaches to establishing value. However, this did not mean that skills and knowledge of valuers were necessarily adequate, especially in the light of both technology advances and changing market contexts; indeed, as both Warren-Myers (2018) and Sayce (2018) argue, valuers still need to develop deeper knowledge of sustainability issues.

Discussions around valuers' skills and knowledge base fed into wider discussions within RICS leading to strengthening of the requirements on and recommendations to valuers within their Global Standards in 2017 (RICS, 2017 [a]). The forthcoming publication of an Insight Paper providing guidance and recommendations to valuers (RICS, 2019) is an initiative which is a direct result of REVALUE and aims to update valuers with their knowledge of the energy efficiency and value relationships related to residential property in Europe. Further, the training package is under development to form part of the RenoValue training which is available free to all valuers. Collectively these new products and the revised standards should better ensure that, as data streams are enhanced, the integration of energy efficiency will increasingly form part of the valuer's judgement.

#### **Green premium vs. brown discount**

The green premium versus brown discount dialogue has been embedded in discussions and literature since around 2009. The evidence points to energy efficiency beginning to impact value, though at a small scale compared with traditional value drivers. The strongest statistical evidence comes from large-scale hedonic analyses. In REVALUE, the team found evidence that whilst a premium may exist, the brown discount is more marked.

However, such quantitative studies may give observation of what is happening but cannot provide the reasons why. The qualitative findings, therefore, were a very insightful complement in helping the team understand the observed changes. These vary depending on the stakeholder group but include regulation, the social agenda (health, well-being and relief from fuel poverty) and, critically, the changing views of the lender. This deeper understanding of motivations can start to drive policy forward in terms of what 'nudges' or grants might further stimulate market transformation. For investors and lenders, the risks to value of properties with energy efficiency below the average

are greater than the monetary gain of a green premium. Therefore, the financial business case is predicated on perceptions of risk, including the risk of regulation impacting on the future use of such buildings and, for social landlords, notions of delivering their mission responsibly. The project has, through its results, added to the professional knowledge base in the area; this is critical as it can feed through to policymaking in relation to grants, regulation, and investment decisions.

## INTERPRETING FINDINGS FOR DEVELOPMENT OF ENERGY EFFICIENCY VALUE OVER TIME

### *Drivers of value development*

The initial presumption of REVALUE was that recognition of the value of energy efficiency quality of dwellings could lead to increased investments and financing in sustainability enhancements. This was seen as likely to provide a crucial step in supporting large-scale transition of the market. However, this it is not currently demonstrable to any major degree. But it is on the agenda of all stakeholders, including valuers. In the medium to longer term, energy efficiency and, it is suggested, energy sources, may become more recognisable value drivers. But it is likely to appear as discounted values where buildings fall below market expectations.

In summary, the impact of government and professional body regulation, energy pricing and incentives, the increasing numbers of tenants and owner-occupiers who are both energy-wise and environmentally aware, and the rise of corporate responsibility policies all point to market transformation. The issue is whether the combined effects will be sufficient to meet policy objectives. Recent reports strongly suggest that regulation is the most effective route but that targets will not be met on current predictions.

Much will depend on how different stakeholder groups respond moving forward.



- **Policymakers:** Driven by sustainability considerations, regulation is able to force intervention which in turn might support the speed at which value differentiation occurs. An example is the UK's minimum energy standards on investment stock. Such policies are still rarely used. The 2018 EBPD requires countries to set targets for renovations by 2021, in order to achieve near-zero energy by 2050. Short-term interventions such as subsidies lead to increased uptake of supported technologies, but not to a sustained change of value.
- **Investors and social housing providers:** Driven by changing expectations on dwelling standards and amenities, combining mental and physical well-being (including feelings of security and comfort), sustainability, and energy cost considerations are firmly on the agenda. However, apart from a minority of green-conscious consumers, such changes are expected to be slow, with the exception of vanguard investors.
- **Lenders:** reduced credit risk is perceived for 'green-conscious' client segments, and future-proofing for regulatory and consumer trends, leads some frontrunners to offer lower interest rates (a short to medium term impact). Large-scale impacts are expected only through regulation or policies such as favourable conditions for green renovation projects on the capital markets, loan-to-value ratios, or property-linked financing.
- **Occupiers (tenants and owners):** Over time, expectations in relation to standards and amenities change. Higher costs of energy, greater awareness of how newer, more efficient stock can provide health and well-being benefits all point to demand (and values) shifting towards energy efficient stock – but only when appropriately located, and with accommodation and facilities that meet needs, aspirations and budgets. As the majority of buyers require borrowed funds this ties in to the lenders' agenda. For tenants, there is often an inadequate choice of affordable units; change here will be slow and incremental and point to 'brown discounts'.

### *Dynamics of value development*

- Markets currently do not generally recognise energy efficiency as a significant value component in pricing. As so much residential stock is sub-standard, any which is significantly above the average energy efficiency may benefit from this 'halo' effect; but currently this is not strongly evidenced. The current balance of stock between energy efficient and non-energy efficient will change over time, as new stock is built to higher energy standards, and as retrofits are undertaken. As a consequence, it is likely that any premium attached specifically to energy features will not be maintained. As refurbishment and new build shift the median from a C/D rating to an A/B level, then it is more likely that brown discounts will be more prevalent.
- A consequence of 'brown' discounting will be that over time, an increasingly number of properties will be viable for redevelopment or upgrade; the danger is that the costs will make these unaffordable to those of low financial means, unless upgrade costs can be contained.



## CONCLUSIONS

The REVALUE project has been a journey, undertaken at a time of change in market environments. It has led to a deeper understanding of the role that valuers and their clients play. Valuations are not 'tick box' exercises, they involve a complex process involving careful judgement as value arises from a whole 'eco-system' of connected factors. It is therefore unhelpful to simplify it to a few factors. However, whilst it was found that valuers were more aware of energy efficiency than originally assumed and took into their overall judgements many building features which impact on energy efficiency, the process of valuation did not, at the start of the project encourage valuers to gather and analyse energy-related data. This is now changing, and the Insight Paper contains a set of recommendations for valuers:

- recognise and be knowledgeable about the potential impact of climate change on the residential building stock and the consequent need for the majority to be upgraded to meet carbon targets;
- be aware of the changing market place and the varied motivations to upgrade, together with knowledge of the changing regulatory landscape;
- work with clients to improve the quality and quantity of the data collected and analysed, in order that they have a firmer basis on which to undertake future valuations;
- recognise that, overall, occupier and investor behaviour and demand is moving towards more energy efficient assets, which is leading to the risk of value decline for non-resilient stock;
- recognise the implications of the regulatory frameworks that exist and are being introduced, both by the EU and in member states, to impose increasingly higher mandatory energy standards to both new and existing buildings;
- where possible (and appropriate), advise clients of the risks presented by properties that are energy inefficient; this may include the risk of such assets becoming 'stranded' in the event of increased regulation or suffering from 'brown discounts'; and
- develop a more granular knowledge

of services and structures that might influence the cost and feasibility of energy retrofits, and work with other professionals to ensure that appropriate advice is supplied to clients.

This set of recommendations, not only presents a real advance in thinking but sets a clear trajectory for the future. REVALUE has helped to develop not just a way to develop valuers' understanding of energy efficiency and practice, it has provided insight into what really drives investment decisions for energy upgrades among, in particular social housing providers. Through more informal discussions with stakeholders, partners came to have a deeper understanding of the following key considerations:

- Some building quality factors and building services are reflected in values. Whilst it did not prove possible to analyse buildings according to the Tabula data sets as the data was simply not there, there was clear evidence that the expectations of owners and occupiers is changing, and these preference changes feed through to value.
- investor upgrade decisions are based on a range of factors including costs, financial return and finance availability.

Health and wellbeing, relief from fuel poverty, comfort, security and social impact are important drivers too.

- Investors generally wish to undertake works 'in-cycle'; therefore, there is a preference to undertake upgrades holistically and not in isolation and out of cycle; this may preclude the use of grants. Similarly, their access to upgrade finance is based on corporate strength not the value of improvements
- For individuals, however, grant schemes may be effective, if heavily promoted but they can be tainted by perceptions of poor workmanship or their temporary nature. To achieve high uptake and effect real change, the German scheme KfW (which offers consistent long-term support) appears to be a model of success.
- Occupier preferences are changing, driven by factors that impact on energy consumption and efficiency.

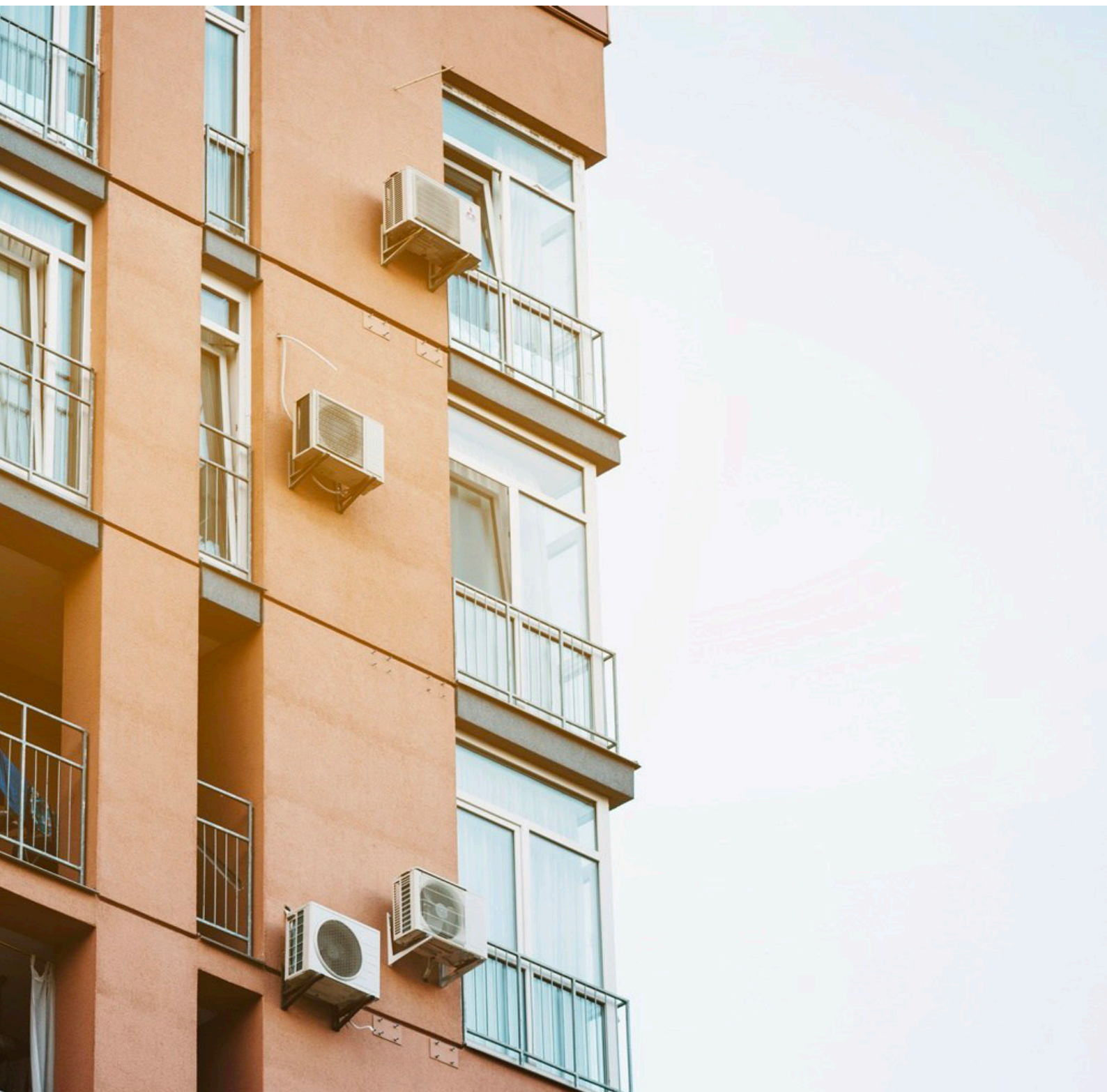
They are impacted by local context, including costs of fuel, climate conditions and cultural and regulatory context. Therefore, the impact in countries such as Spain is likely to differ from those in Germany or Netherlands. As expectations change, buildings that are 'left behind' will increasingly suffer from 'brown discounting'.

It must be recognised that barriers to energy upgrading still exist. The business case is still unclear at times; technologies are not always understood and some fail; EPCs do not necessarily produce useful decision-making information; grant schemes can distort markets and data availability is a continuing (if reducing) issue. However, in terms of the overall objectives, the project has achieved notable successes. It has:

- helped to reduce uncertainty in how to link energy efficiency and value by adding clarity to valuation norms and standards through changes to the RICS Red Book and provision of additional guidance, with further training planned by enabling a link to be made between energy efficiency and value;
- consulted with stakeholders to better to enhance trust in revised valuation standards and guidance;
- helped to contribute to the body of understanding and knowledge accessible to investors and financiers in how to recognise energy efficiency in asset values and, for lenders, in the risks to their lending;
- through the various research instruments employed, added to the body of knowledge articulating the link between energy certification and value which combined with RICS' proposed programme of events and training, could and should lead to higher levels of skills and knowledge of energy matters amongst valuers.



# REVALUE



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