REVALUE

Dissemination to Valuation Profession report

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Executive summary

The REVALUE project aims to lead the development of appraisal norms and standards that recognise Energy Efficiency (EE) value in social and private residential real estate.

This report details the dissemination activities in relation to:

- Standards Development and Professional Guidance in which the interface with professional boards and groups which has been instrumental in standards development;
- Events /conferences demonstrating engagement with professional valuers in a range of EU member states;
- Other means of communication, such as the use of professional journals;
- Policymaking – including connections with other EU funded work and groups such as UNEP FI, via expert networks and events;
- Skills & training – in which plans for future training programme for valuers are presented;
- Research – future research papers planned.

Overall, the dissemination to date has reached many thousands of valuers, in the EU and beyond. The project has assisted in terms of developing standards and, through the events and other communications planned, the total number of people reached would be capable of influencing practice moving forward. More importantly, it is also reaching the client base and better equipping valuers to provide targeted advice to their clients.

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Chapter 1 Introduction

RICS has been a very active participant in the REVALUE project, co-funded by the EU. The project aims to lead the development of appraisal norms and standards that recognise energy efficiency value in social and private residential real estate.

This document should be read as a complement to Deliverable 5.6. *Communication Packag*e, as it includes many of the communications issued by RICS in relation to the project. This document presents a summary of the dissemination to valuation professionals that have taken place both during the REVALUE project and planned for after the project reaches its formal end point. RICS has interacted with the professional valuation community throughout the REVALUE project, both formally and informally. Further, dissemination to valuers has formed a crucial part of the research methodology.

As the body with the responsibility for setting mandated standards for their members worldwide, RICS ensures numerous avenues by which members are informed of important developments which impact their practice. The key standards are laid down in the Red Book, but augmented by Guidance Notes and Valuation Insight papers, all as reported in Deliverable 1.4 *Set of validated recommendations for European norms and standard*s. The development of these publications takes place through, and is overseen by, the Valuation Boards and the deliberations of the Boards feed into planned communication via the events team and the publications team and via news feeds and the website. The former organises continuing professional development events and often supply speakers for other conference organisers where the agendas are relevant to valuers; the latter communicate via in-house publications such as Modus (an international magazine for the surveying profession). Collectively, these provide opportunities to ensure that practitioners are abreast of developments which impact on their approach to their work. Last, they produce training materials online via the RICS Online Academy. Some of these are full cost programmes; others where the material is regarded as critical may be offered free of charge.

The document now provides an explanation as to how dissemination to valuers (both past and pending) will ensure that they are better informed regarding the REVALUE project and energy efficiency and value matters in relation to residential property.

Chapter 2 Avenues of Dissemination and Dissemination Activities

2.1 Standards Development, Professional Guidance and RICS Decision-Making process

At the start of REVALUE, RICS operated a set of valuation standards that were effective from 2014. For the first time, this edition contained a direct reference to sustainability; additional material, in the form of a guidance note (GN), published in 2013, related only to commercial property. For residential property, an information paper had been produced in 2011 but this referred to UK property only.

During the course of REVALUE, RICS updated the Red Book and the extant edition was published in 2017. Members of the REVALUE consortium were involved with this re-write which was signed off by the Global Valuation Board. This strengthened the requirement on valuers to specifically consider sustainability and is part of the deliverables suite of REVALUE. The issue of sustainability is now a standing item on both the Global and UK Valuation Boards and progress on REVALUE has been reported back to the Board Meetings. The minutes of these meetings are distributed and thus, the work of REVALUE has been fed back through a number of channels. Further, RICS is reconvening its Sustainability Task Group, charged with further developing consideration as to the role of the valuer moving forward, notably in relation to supporting the climate change agenda.

However, undoubtedly, the biggest dissemination channel for REVALUE to the valuation community will be the publication of an Insight Paper on *"Energy Efficiency and Residential Values: A Changing European Landscape"*. Whilst this paper is not exclusively based on REVALUE, it draws heavily on the findings of the project and sets out a series of recommendations for valuers across all member states. Publication is targeted for the end of February 2019 or early March 2019.

2.2 Events and Conferences

As stated above, the RICS run a series of continuing professional development (CPD) events and REVALUE has been specifically reported as follows:

RICS Organised Events:

- March 9th 2016: RICS UK Valuation Conference presentation on REVALUE aims and activities to approximately 100 RICS valuation members;
- July 6th 2016: RICS UK Residential Conference presentation on REVALUE: Assessing the Value of Energy Efficient Properties in the Residential Rented Sector to approximately 80 RICS members engaged with the residential sector many of whom were valuers;
- March 1st 2018: RICS UK Valuation Conference presentation on energy and value, including REVALUE, to approximately 100 RICS valuation members;
- November 7th 2018: Renewable Energy Association/RICS Clean Tech in Property Conference presentation and panel contributor attended by approximately 60 people – mainly energy specialists.

Other conferences/CPD events:

- July 5th 2016: BRE (Building Research Establishment) Briefing Conference presentation on REVALUE to an audience of approximately 120 people mainly industry participants;
- October 20th 2016: Green & Healthy Homes Conference Maastricht University presentation on Energy and Value and REVALUE Project to an invited audience of approximately 50 people of investors, industry experts, banks and academics;
- March 9th 2017: Eco-Build 2017 seminar presentation at major industry event entitled: Connecting Building Performance and Value: The State of Play at major industry event. Circa 80 people attended this presentation, mainly valuers and industry participants;
- February 9th 2018: ABRACADABRA International Workshop 2018, Brussels presentation entitled: Building the Value: some reflections to approximately 70 people mainly member of industry and property owners;
- February 16th: Savills London Presentation and Roundtable discussion on the REVALUE findings to an invited group of senior valuation professionals;
- June 22nd 2018: Brussels: Presentation and Roundtable discussion on the REVALUE findings to an influential invited audience;
- October 1st 2018: Savills London Conference on REVALUE findings: presented the qualitative findings and the Regression findings to an invited audience of some 40 people.

Valuers were present at all of these events; in some, they even made up the majority of the audience. In others, there was strong representation from their client base.

In addition, as part of the qualitative research a series of six workshops were held with residential valuers. The findings from these are written up in Deliverable 2.4 *The impact of energy efficiency on residential real estate value*s. Three were in the UK (London, Birmingham and Leeds) and three on the mainland (Amsterdam, Barcelona and Brussels). Whilst the prime objective of these workshops was to gather information as to current practice, they also presented the opportunity to disseminate the changes to the Red Book and initial REVALUE findings.

Moving beyond the end of the funded period of REVALUE, RICS Valuation Directors will seek opportunities to promote the findings of REVALUE and the Insight Paper at events to be held throughout 2019 via Roadshows, Breakfast Briefings and other events. Overall, direct contact has been made with many hundreds of professionals and many of the client base and other real estate professionals.

2.3 Other communications

Communication via other mechanisms is also taking place. The lead authors of the draft Insight paper have recently published (December 2018) an article for the Australian and New Zealand Property Institute Journal (see Annex A); a further article to has been accepted and should be published very shortly in RICS' own hard copy journal, Modus. Both these articles draw down on REVALUE and the Insight Paper. Circulation for the former runs to excess of 8,000; for the latter, it is significantly more

given that RICS has a worldwide membership of some 100,000 of whom more than 20,000 are valuers. In addition to the hard copy that will be distributed to many members, Modus is promoted on the RICS website and via social media. Therefore, this article will ensure that most valuation members of the profession will have received information on REVALUE. The authors of these outputs intend to write a paper for a peer-reviewed journal; opportunities will also be taken to address academic conferences. Further, other members of the consortium are in the process of writing a paper for a peer-reviewed journal on the regression analysis (see paragraph 2.6 below) used in the project.

2.4 Policymaking

Dissemination to policymakers has been an important part of the strategy to ensure that the matter of energy efficiency and its relationship to value is understood. Too often there has been a view that, within the residential market, a financial business case exists based on enhanced capital and rental values and reduced operating costs. What has been revealed through the project is that whilst this may be the case at aggregated levels in some location, the relationship is complex and founded on a range of social, as well as financial, imperatives and motivations. This message is critical for policymakers as it impacts on decisions about how best to stimulate market transformation: if capital value driver is not a key aim, then promoting this argument may be futile; however, if annual costs savings are currently insufficient to drive behaviours then grants and subsidies might be required. RICS has engaged a range of policy stakeholders and groups. For example, the RICS members of the REVALUE team have worked closely with the Brussels office, with the RICS Global Head of Sustainability, and have reported back to members of the EeMAP project and to the UNEP FI Investment Commission through their Property Working Group. The latest meeting was on 28th November 2018 and the results of REVALUE were presented.

2.5 Skills and Training

A consultant to RICS writes a regular update on Environmental and Sustainability in Valuation column for a RICS online information channel (i-surv). This is currently only available to UK RICS members through subscription, but education providers are given free access. REVALUE has already been reported to this channel but a further update to include the recommendations of the Insight Paper will be submitted shortly. The circulation of this is likely to be several thousand – and includes aspiring student members.

Further, the RICS offers training through its online Academy. The majority of the courses offered are for payment but where there is felt to be a pressing need to update members, training is provided free of change. As a result of another EU funded project (RenoValue), there is a free 1.5 hour module available entitled RenoValue: Integrating Sustainability into Valuation Practice. This is in the process of being updated to a more flexible modular form to structure the materials into levels and to enable the modules on specific project outcomes, such as REVALUE to be included. The training will therefore enable those undertaking residential valuations to access material tailored for them. This work is in process but will not be completed until an estimated June 2019.

2.6 Research

In Paragraph 2.3 above, it was stated that articles for professional journals have been written. These, together with the outputs of overall results, the Insight Paper and the regression findings are planned to be developed by members of the consortium into papers for submission to refereed academic journals. Currently, the paper on the regression findings is close to submission; one based on the Insight Paper is at a fairly advanced stage and one on the qualitative research with valuers is planned. Collectively, these planned papers will ensure that the REVALUE outputs are communicated to represent a lasting and important channel to connect with academia and hence the next generation of valuers throughout Europe and even beyond.

Chapter 3 Conclusions

One of the requirements of REVALUE is that dissemination takes place through RICS to ensure that valuers are informed, and if appropriate, trained. The account above provides evidence of ongoing connection via conferences and meetings with the target audience. Further, the subject material has now influenced the development of standards and the supporting Insight Paper is being widely disseminated through a range of channels. The fact that energy and wider sustainability matters are now firmly embedded within the current board structure should ensure that the discussions and findings lead to a furtherance of the journal to help all those involved with the valuation of tangible assets to better advise clients and be more explicit in terms of the relationship between value and energy efficiency. Developing training materials and making them widely available should, along with academic papers, help to embed the subject within the education of both current valuers and the new entrants to the profession.

Appendix A Australian and New Zealand Property Institute Journal article

PROPERTY

GLOBAL TRENDS IN

ENERGY EFFICIENCY & RESIDENTIAL PROPERTY VALUE

Associate Professor **SARA WILKINSON**, UTS and Professor **SARAH SAYCE**, University of Reading UK, discuss the impact of energy efficiency on the value of residential property

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We are currently experiencing declining residential property values in Australia, after a long period of exceptional growth. What measures can homeowners, developers and investors make to protect the value of their assets and can they do this through energy efficiency measures, which concurrently make a positive contribution to a global challenge facing humanity? The answer- at least in part - could be to design, develop, or retrofit for energy efficiency.

This article asks; what is the current impact of energy efficiency on the value of residential property? And, what is the evidence globally, that energy efficiency is related either positively or negatively to value? This article presents the latest evidence from Europe, the US and Australia.

The residential property market exists in an evolving, dynamic context of legislative and social frameworks, as well as local, regional and global economic circumstances. Overall, the residential market accounts for around a quarter (24.8%) of EU energy consumption, and buildings overall consume 38.1 per cent of energy (EU briefing 2016); statistics, which have been broadly consistent since the mid 1980s. In Australia, statistics are presented differently, in a greater number of sectors, where housing constitutes 7.5 per cent of the total, however over the last decade it has, and continues to increase by 0.8 per cent per annum (Department of the Environment and Energy, 2017). The sector offers great potential to reduce the greenhouse gas emissions which contribute to global warming and climate change. This contribution from the sector, and the ability to mitigate the impact of climate change, is widely acknowledged by the UN, the Intergovernmental Panel on Climate Change (IPCC), governments, research institutes and professional bodies.

In 2018 the IPCC released their latest report, confirming we are on track for a 1.5 degree global temperature increase, and there is only a dozen years for warming to be kept to a maximum of 1.5 degrees. This temperature increase will result in sea level rises and changing patterns of weather globally. Locally, Australia is predicted to experience an increased number of days with intense heat and even higher levels of heat. The 47.3 degrees Celsius experienced in western Sydney in January 2018 will not be exceptional in the future.

Consequently, the demand for energy to cool property will increase, and with increasing levels of social inequality, the increased costs of energy will be unaffordable leading to negative health outcomes and at worst, fatalities. The need for housing energy efficiency then, has never been greater.

Whilst new stock can be designed to mitigate the worst excesses of climate change, adaptation of buildings for climate resilience is more challenging.

In theory, as an energy efficient building has lower running costs, there should be a value increase consequent on improving efficiency, but is this the reality? Certainly, valuers have a role to play in advising clients of the impacts of energy efficiency on the value of residential property, be it owner-occupied stock, or rented within the private sector (PRS) or as social housing, but they follow the market: they do not make it and their role is to work with market evidence.

THE BIG PICTURE

European housing stock is characterised by its age and energy inefficiency; using data from 16 European countries, the Buildings Performance Institute Europe (BPIE, 2017) found that only three per cent of stock is built, or improved, to the highest energy standards.

Whilst these figures relate to stock in general, the residential stock is thought to show a profile similar to all properties. Analysis conducted by the World Green Building Council (WGBC, 2018), using government data, showed that, in general, the energy efficiency of stock correlates closely to age; and that rented stock is likely to have a lower efficiency than owner-occupied housing. In Australia, stock may be younger, but given that energy efficiency for residential property was not mandated in the Building Code of Australia until 2003, the vast majority of our stock is very inefficient thermally. In comparison EU countries started mandating minimum standards of energy efficiency in the 1980s.

European member states signed up to the 2015 Paris Climate conference COP21 objective seeking to control climate change to a targeted 1.5 degree Celsius temperature rise. Across the EU targets for reductions of 80 per cent of carbon emissions from a 1990 base have been agreed and, in some countries, formalised into legal, monitored, obligations. Again, globally there are inconsistencies in approach and targets set by various governments.

MEASURING ENERGY EFFICIENCY: A UNIVERSAL CONCERN BUT NO ONE MEASURE

There is no one universal measure of energy efficiency within buildings. This is understandable given the widely differing building

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typologies and climatic conditions and prevalent energy sources used globally. The common metric in the EU is the Energy Performance Certificate (EPC) mandated by the Energy Performance of Buildings Directive (EPBD) 2002/91/EC (as amended). EU member states had to introduce a system that ensured:

1. Every building offered for sale or lease should have a valid EPC and that this should be featured in all advertising;
2. Measures to establish inspection schemes for heating and air-conditioning systems or take measures with equivalent impact were undertaken;
3. All new buildings be constructed to nearly zero energy standard by 31 December 2020 (public buildings by 31 December 2018);
4. Requirements are introduced for minimum energy performance requirements for new buildings, for buildings subject to major renovation, for the retrofit of building elements; and
5. National financial measures and instruments to improve the energy efficiency of buildings are introduced.

Australia adopted the National Home Energy Rating (NatHERS) star rating system in 2003 for new buildings. NatHERS uses computer simulations to determine the potential thermal comfort on a scale of zero to 10 stars. Houses built in 1990 averaged one star on the NatHERS scale, indicating contemporary standards. Before the introduction of national energy efficiency regulations for houses in 2003, less than one per cent of Australian houses achieved six stars.

The NSW Government established the Building Sustainability Index (BASIX), which sets minimum standards for all new dwellings and alterations and additions to existing dwellings. BASIX is applied through a NSW planning regulation that sets percentage reduction targets for greenhouse gas emissions and water use for dwellings of a similar size in the same geographical location. BASIX covers the building envelope thermal performance and a wide range of household energy uses by fixed equipment such as heating and cooling appliances, lighting and hot water. The design must pass specific targets before a BASIX certificate can be generated.

Since the early 2000s, various incentives have been implemented to promote energy efficiency across all housing sectors in a number of countries. Energy efficiency can be delivered through a combination of improvements to the building fabric in new and existing buildings, and/or with the installation or replacement of building services, such as heating and cooling equipment, lighting and other appliances to lower energy demand (RICS, 2011. Wilkinson et al, 2014). The measures adopted include those outlined in the Energy Performance of Buildings Directive (2003, 2010), the Energy Efficiency Plan (2011) and the Horizon 2020 Energy Efficiency Stimulus Package (2014).

One issue with all measures is compliance: what are the penalties for not complying? If they are not strong, then the measures will not lead to market movement. An example of a stringent measure is the recent regulation brought in in the UK, whereby all new lettings (and shortly) existing lettings will be unlawful if the property fails certain energy standards.

THE ROLE OF THE VALUER

Residential valuations are performed for various purposes, such as; sale/purchase; secured lending; investment monitoring/decision making and for entry into company accounts.

Professional Valuers are bound by valuation standards, set by professional bodies such as API and RICS. For most purposes the basis of valuation will be Market Value or, in the case of investment decisions, Investment Value.

Valuers have a role to play in advising clients on the impact of energy efficiency on property value

The Valuers' role is to reflect the market; therefore they can only reflect the energy efficiency of a property to the extent that it is an identifiable value driver. The challenge for Valuers is how, using evidence of comparable transactions, to analyse the impact of energy specifically against the factors that drive market behaviours. This is a challenge when valuing within a context in which the evidence is primarily derived from owner-occupation sales.

When preparing a calculation of investment value, the importance of energy efficiency factors can be factored in to a Discounted Cash Flow.

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.

RICS guidance to Valuers in the Red Book (2017) advises them to:

1. Assess the extent to which the subject property currently meets sustainability criteria and arrive at an informed view on the likelihood of these impacting on value;
2. Provide a clear description of the sustainability-related property characteristics and attributes that have been collected;
3. Provide a statement of their opinion on the relationship between sustainability factors and the resultant valuation, including a comment on the current benefits/ risks that are associated with these sustainability characteristics, or the lack of risks; and
4. Provide a statement of the Valuers' opinion on the potential impact of these benefits and/or risks to relative property values over time.

Further in relation to secured lending valuations, Valuers are advised that sustainability factors are becoming a more significant market influence and therefore valuations for secured lending should always have appropriate regard to their relevance to the particular assignment. Further, Valuers are advised to comment on the maintainability of income over the life of the loan (and any risks to the maintainability of income), and this may need to be considered in a broader sustainability context.

The aim is that results will provide greater transparency in valuation reporting and heighten awareness of sustainability to clients and Valuers. By, and of, itself however, more forensic inspection, analysis and reporting will not provide the speed and size of market shift that is required to meet member state climate change commitments.

Ultimately, the value of any residential unit depends on the relationship between market demand for that type of unit in any given location and the supply of appropriate stock. The Valuers' role is to interpret economic, social and environmental factors reflected through either analysis of transactional evidence or investment characteristics, included projections of costs and income, to arrive at an estimate of value. The Valuer is a 'reflector' of social and economic patterns and the influence on value of energy efficiency will, or should, be assessed within the Valuers' understanding of how market players are responding to the energy agenda.

THE EVIDENCE

Over twenty one studies globally have been conducted into the relationship between energy efficiency in the owner occupied, private rented and social housing sectors (see for example; Brounen & Kok, 2011; Hyland et al., 2012, Cerin et al., 2014. Fuerst and Warren-Myers, 2018). For social housing, however assessed values were used in lieu of actual transaction data. Social housing comprises around 17 per cent of overall EU housing stock, and ranges from 28 per cent in the Netherlands, 22 per cent Austria, 20 per cent Sweden to 18 per cent in the UK.

Hedonic analysis has been the favoured method of assessing the relationship between capital and rental value data of properties and energy efficiency. Table 1 (over) summarises key findings of some of the studies, after which greater detail is provided on a few selected studies.

One of the most wide-ranging recent hedonic studies (not included in Table 1) was conducted as part of the EU project 'revalue' (http://revalue-project.eu/). This examined reported values of thousands of valuations for social housing in the UK, Netherlands, Sweden and Germany and their respective Energy Performance Certificates (EPC labels and EPC and Standard Assessment Procedure (SAP) indexes). It concluded that energy efficiency, whilst a discernible element within a calculation of value, was far outweighed by traditional factors and mainly related to visible components affecting energy performance (e.g. provision of double glazed windows. This study is important, as it analyses not just a general relationship based on energy labels but on specific features.

Few studies explore the relationship between energy efficiency and residential property values in Australia. Fuerst and Warren-Myers (2018) analysed transactions in the Australian Capital Territory (ACT) from 2011 to 2016. The ACT is the only State or Territory in Australia to mandate energy ratings for housing at the point of sale or leasing. 31,061 and 67,607 transactions were analysed respectively, using a hedonic framework (Fuerst and Warren-Myers, 2018). For sales, an earlier, smaller study of 2385 and 2719 properties had established a one per cent increase in values in 2005, and two per cent in 2006, for every half star increase in the energy efficiency ratings (Fuerst and Warren-Myers, 2018). They found exceeding the building code minimums in respect of energy efficiency was rewarded in higher values by 9.4 per cent for 7 star properties to 2.4 per cent for 6 star properties. At the other end of the spectrum high energy features were associated with a brown discount of 4.5 per cent for electric heating systems and 1.5 per cent for gas

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TABLE 1: SELECTED STUDIES EVALUATING ENERGY EFFICIENCY AND RESIDENTIAL VALUE

COUNTRY	SAMPLE SIZE	DATES	VALUE EFFECT (+/-)	SECTOR (OO, PRS, SH)	PREMIUMS
SPAIN	1,507	2015	+	OO	Between 5.4% and 9.8%.
NETHERLANDS	17,835	2008-2013	+	SH	2.0% - 6.3% rental premiums.
SWEDEN	77,000+	2015, 2016	+	OO	Higher values for high energy efficiency components, i.e. triple glazing and lower consumption (i.e. heating costs).
FINLAND	7,000	2015	+	OO	Premium 3.3% apartments
HUNGARY	1,399	2012	+	OO	Premium 9.42% for retrofitted apartments
GERMANY	2,630	2008-2010	+	OO	Premium up to 3.15%
				PRS	0.76 euros/m2 rental
IRELAND	40,568	2011	+	PRS	Premium rental for EPC Band A was 1.8%, B Band 3.9%. E rated discounted at 1.9%, F and G discount 3.2%. All compared to D rated stock.
		2009-2014	+	OO	Premium of 1.5%
UK	333,095	1995-2012	+	OO	Premium for EPC Band A & B 5%, C Band 1.8%.
AUSTRALIA	98,688	2011-2016	+	OO	Premium 7 Star 9.4%, 6 Star 2.4%. 0 Star discount 2.8%, 1 Star discount 2.4%.
				PRS	Rental premiums of 3 Star 3.5%, 6 Star 3.6%, 7 Star 2.6% and 8-10 Star 3.5%.
USA	6,000	1997-2007	+	OO	Energy Star dwellings sold for a premium between 1.2% and 1.8%.
		2012	+	OO	Energy Star, LEED and GreenPoint dwellings sold for 4% premium

(Source: Authors). Hedonic analysis has been the favoured method of assessing the relationship between capital and rental value data of properties and energy efficiency in Table 1. Here researchers benchmark median values for residential property types in various areas and then review properties with energy efficiency measures, such as double glazing for example, to ascertain whether they achieved a higher sale price. The differences between the 'energy efficient' stock and stock is then calculated as a percentage.

heating systems (Fuerst and Warren-Myers, 2018). In the leasing market zero star and one star properties let at a discount of 2.8 per cent and 2.4 per cent respectively, while three star rated properties had a 3.5 per cent rental premium, and six, seven, and eight to ten star stock had premiums of 3.6 per cent, 2.6 per cent and 3.5 per cent respectively. The results of sales data is robust, however results are affected by high levels of non-disclosure (>50%) in the rental market (Fuerst and Warren-Myers, 2018) and they recommended mandatory disclosure is extended to this sector. Two UK studies are now reviewed. Fuerst et al., (2015) investigated EPC ratings and transaction prices in England involving 333,095 dwellings sold at least twice between 1995 and 2012. Applying hedonic regression and an augmented repeat sales regression, a positive relationship between the energy efficiency rating of a dwelling and the transaction price per square metre was found. The price effects of superior energy performance were higher for terraced dwellings and flats compared to detached and semi-detached dwellings. Dwellings in EPC bands A and B sold for five per cent above mean prices, whereas C band property had a 1.8 per cent premium (see Table 1) (Fuerst et al., 2015). The evidence was less clear-cut for rates of house price growth but remains supportive of a positive association. Overall, the authors argued energy efficiency

labels have measurable and significant impacts on English house prices.

A second study (Fuerst et al., 2016) examined the capitalisation of energy efficiency ratings into Wales house prices using two approaches. The first adopted a cross-sectional framework to investigate the effect of EPC band (and EPC rating) on a large sample of dwelling transactions. The second approach used repeat-sales to examine the impact of EPC band and rating on house price appreciation. The results showed that the EPC band was connected with house prices.

However, the observed influence of EPC on price may not be a result of energy performance alone; the effect may be due to non-energy related benefits associated with certain types, specifications and ages of dwellings or there may be unobserved quality differences unrelated to energy performance such as better quality fittings and materials.

Analysis of the private rental segment revealed, in contrast to the general market, low-EPC rated properties were not traded at a significant discount, suggesting different implicit prices of potential energy savings.

Compared to other countries (see Table 1), Australia recorded some of the highest premiums, indicating energy efficiency has been appreciated in the top end of the market. Significantly, discounts occur for low performing property and it is likely in the currently falling market these discounts will increase. Whilst we have a stock of poor thermally performing buildings in Australia, there does appear to be an appreciation for energy efficiency, which is likely to grow over time as climate change impacts become more marked. The outcomes of academic quantitative large scale studies conducted in the last decade examining the relationship between energy efficiency and observed prices (rental and capital) in the residential markets shows values are significantly aligned. However, valuable as these large scale studies are, a valuer is faced with assessing an individual unit or, in the case of a portfolio, a group of units, and must rely, through their due diligence process, on evidence that is local, recent and defensible against any negligence claims.

Recent qualitative research, also part of the revalue project (**http://revalue-project.eu/wp-content/uploads/2018/07/D2.4-Final-Version.pdf**) does not bear out the findings of the quantitative studies. The finding here, bearing out the suggestion in the revalue hedonic study, is that factors such as windows, which may help provide energy improvements, are important but energy overall is low down the list of value attributes. However as new stock comes on stream and improvements to stock take place – many buildings will suffer a 'brown' discount.

BALANCING THE EVIDENCE

The evidence points to energy efficiency beginning to make a value impact, although this is in many cases very small compared with the traditional value drivers. Whilst the strongest statistical evidence comes from large-scale hedonic analyses, practice- based research provides evidence regarding what is driving the observed changes. These vary depending on stakeholder group, but include regulation, health and wellbeing and, critically, the changing views of financiers. In future, energy is likely to be of increasing importance in the decisions of occupiers and investors and that this will reflect in value. However, much will depend on the approach taken to regulate and grant aid for improvements and to the attitude of lenders and the awareness of Valuers. ●

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