

REVALUE

Dissemination to Energy Assessment and Real Estate Industry

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REVALUE partners

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Executive Summary

Over the course of the REVALUE project, the partners have remained in close contact with the relevant stakeholders in the real estate industry in order to run the project's working and final assumptions by them. As stated by RICS, "valuers do not make markets; they reflect them. Their skills and expertise lie in interpreting data as supplied by clients and gathered through their inspection and due diligence process."¹ Therefore, these interactions with the market participants were key to completing the REVALUE aims.

At the start of the project, REVALUE partners established connections with stakeholders who have a role in the RICS guidance development process, as well as other similar European projects (RENOVALUE, RENTALCAL). These initial interactions led REVALUE partners to slightly re-design the project approach and work flows. Halfway through the project, the stakeholders working with valuers and valuers themselves were approached. As valuers follow the market, the REVALUE partners established connections with lenders and housing providers to understand what aspects of energy efficiency the stakeholders are taking into consideration. The expert group meetings with the real estate industry in different countries helped the REVALUE partners to better understand how perceptions of the market are changing, what the stakeholders' long-term views are and the differences across EU markets. Meanwhile, the meetings with valuers were greatly targeted at understanding if valuers have seen any change in the markets and, if so, what they would expect the professional bodies such as RICS to do.

Finally, in the last stage, the findings of the REVALUE projects were tested with the key stakeholder groups and deemed relevant. All these interactions allowed for REVALUE project to produce recommendations for housing providers, valuers and lenders on how energy efficiency and value are currently connected and assure that the project results landed with the relevant stakeholder groups.

¹ REVALUE D2.4 "The impact of Energy Efficiency on residential real estate values"; available at: <http://revalue-project.eu/wp-content/uploads/2018/07/D2.4-Final-Version.pdf>

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Purpose of this Document

This document² will, firstly, provide an overview of the stakeholder engagement process that REVALUE partnership have gone through over the course of the project. It will list the key activities that were organised in order to gather insights from market participants and it will provide an overview of the topics discussed. Secondly, it will provide an overview of the dissemination and communication activities that Luwoge Consult organised in the project. Luwoge presented norms and valuation techniques as well as relevant findings to EURHONET. Other target audiences could include BREEM, LEED, DGNB, European Green Building Council or Green Star.

² This document is the deliverable of task 5.5 in work package 5: Dissemination, Exploitation, and Communication. The task leader is Luwoge Consult. Its other contributors include Bax & Company, Savills, Maastricht University (MU), Vanhier, and RICS.

Chapter I REVALUE stakeholder engagement process

I.1. Identification of guidance - (until September 2016)

At the start of the REVALUE project, it was essential for REVALUE partners to get a clear understanding of the current state of the art on the energy efficiency and value connection. That's why the partners organised meetings and interactions with the key stakeholder groups over the first 18 months of the project.

REVALUE partners hold expert meetings at national level with practitioners from the valuation sector, landlords and lenders that provided insight in current industry practices, review work done by the project and finally provide input/feedback and communicate on future guidance. Two expert sessions were organised with housing providers in UK and NL, in the United Kingdom (October 2015, London, February 2016 Amsterdam). In Germany, Luwoge individually approached relevant stakeholders over the course of spring 2016.

In addition, the REVALUE coordinator set up connections with relevant projects, stakeholder groups and platforms: such as the RENTALCAL project, an H2020 research project which focuses on finding evidence of the value of sustainability in commercial residential real estate; and the RENOVAlUE project, an IEE project that delivered its final results in the form of online training material, outlining theoretical links between value and sustainability, in mid-2016.

Finally, the project connected to the European Mortgage Federation, who had recently started an initiative on developing and monitoring green mortgages. The link enabled REVALUE to access lenders and get information about banks' current practices with regard to linking sustainability to lending practices, including valuation and more technical aspects. In addition, the project was linked to the European arm of the World Green Building Council, which brings private sector organisations, especially from the building, design and engineering worlds together to support the development of advanced building retrofit strategies.

These initial interactions led REVALUE partners to adjust their initial approach. To maximise the impact of the REVALUE project, it would need to work along guidance by the RICS Sustainability Working Group as this body will ultimately decide which input is needed for developing new guidance and will convert project outputs into guidance and related products. Thus, direct links with numerous RICS representatives were established.

Below is a long list of events where REVALUE project ambitions and assumptions were presented:

I.1.1. REVALUE 1st expert group session

8 October 2015 – London, UK

Partner: REVALUE team

About: To purpose of the UK expert session was for practitioners to reflect on their approach to investment decisions, to discuss practical issues and to explore solutions to barriers to investment in energy efficient solutions in the field of residential properties, in particular the social housing sector.

Audience number: 10 (Deloitte, LG Survey, Broadland Group, Affinity Sutton, RBS, RICS external, Callaway Energy Consulting, Greater London Council, Rickaby Thompson, Places for People, Royal Bank of Scotland)

Presentation details: The REVALUE project's aims and activities were presented to guest.

Category: REVALUE expert group meeting

I.1.1. REVALUE 2nd expert group session

11 February 2016 – Amstelveen, NL

Partner: REVALUE team

About: To purpose of the expert session was for practitioners to reflect on their approach to investment decisions, to discuss practical issues and to explore solutions to barriers to investment in energy efficient solutions in the field of residential properties, in particular the social housing sector.

Audience number: 10 (Waarborgfonds Sociale Woningbouw, De Alliantie, Mitros, GRESB, Savills Amsterdam, Haagwonen, FGH Bank, W/E adviseurs, Energiesprong, ABN Amro)

Presentation details: The REVALUE project's aims and activities were presented to guest.

Category: REVALUE expert group meeting

1.1.2. RICS UK Valuation Conference 2016

9 March 2016 – London, UK

Partner: RICS – Sarah Sayce

About: An annual conference within the commercial property, machinery and business assets, business valuation, trade related property and arts & antiques group.

Audience number: 100

Presentation details: The REVALUE project's aims and activities were presented to RICS members.

Category: Setting standards

1.1.3. Retrofit4Change

5 July 2016 – Watford, UK

Partner: RICS – Sarah Sayce & Fiona Haggett

About: A BRE conference exploring how refurbishment projects can be made more efficient and cost effective through improved management.

Audience number: 100

Presentation details: 'Recognising the value of energy efficiency' – [video available here](#).

Category: Commercial

1.1.4. RICS UK Residential Conference 2016

6 July 2016 – London, UK

Partner: RICS – Sarah Sayce

About: This conference coincided with the introduction of the new Housing and Planning Act – one development set to have significant ramifications for the residential sector. Topics covered included an economic update on current market conditions and an interactive panel debating the changing residential world.

Audience number: 80

Presentation details: 'Re-Value: Assessing the Value of Energy Efficient Properties in the Residential Rented Sector'

Category: Setting standards

1.1.5. WGBC and BUILD-UPON Leaders' Summit: Private Finance for Residential Retrofit

20-21 September 2016 – Madrid, Spain

Partner: Bax & Company – Rolf Bastiaanssen

About: The Summit focused on how we co-design and implement long-term national renovation strategies to improve the energy efficiency of our existing buildings.

Audience number: 200

Presentation details: 'REVALUE Project: Recognizing Energy Efficiency in Valuations'

Category: Financing & Investment

1.2. Mid project consultations – September 2016 to January 2018

After the initial learning, REVALUE partners saw a need to design a new approach for engaging with external experts. It was agreed that a general Advisory Board would not be able to achieve the goals of the REVALUE project, thus it was decided that country-level expert groups will be formed with valuers instead. This led REVALUE partners to organise six roundtables with valuers in four different countries over the course of 2017 (UK, NL, DE, ES).

Further engagements were organized with the Energy efficient Mortgages Action Plan (EeMAP) Initiative, a ground-breaking mortgage initiative to support energy efficiency improvements in buildings. REVALUE was invited to their Madrid leadership summit and, as a follow-up, the RICS senior advisor on valuation guidance development (Sarah Sayce) was invited to join a EeMAP steering group. In addition, through the REVALUE coordinator, the project partners gained access to the technical forum of the Investor Confidence Project (<http://europe.eeperformance.org/>), that set out to standardise documentation for development and financing of energy efficiency projects.

The REVALUE partners organised individual meetings with the housing providers, as the first test group for the initial results of the REVALUE project. More on the results of those interactions can be found in Deliverable 2.3 "Report identifying existing bottlenecks and scope for improvements in benchmark investment programmes³".

1.2.1. Roundtables with valuers

To complement the quantitative studies undertaken by the REVALUE project partners, it was considered important to undertake research to both verify the process undertaken by valuers in key member states engaged with REVALUE and obtain the views of valuers both as to how far EE is a factor in determining market value.

In total, the team held a series of **six roundtable workshops** with a small number of invited valuers all of whom were chosen for their expertise in undertaking residential valuation. The workshops all took place between **June and September 2017**; three were held in England (London, Birmingham and Manchester) and one each in Spain (Barcelona), Germany (Berlin) and the Netherlands (Amsterdam). The variation in location meant that valuers working in different climatic zones and under different legal regimes and market practices were engaged in discussion. In total, some **25 valuers** took part. In almost all cases, the valuers were RICS members and had experience in valuing residential units for secured lending and sale. However, in Spain, participants had less residential valuation experience as the majority of those undertaking residential valuations are not chartered surveyors but *tasadores*, who conduct valuation of domestic units for local banks.

Each roundtable consisted of two phases:

- At the commencement of the workshop, a presentation was made to participants (see Appendix 2). This set out the aims and the extant RICS valuation guidance to valuers.
 - Discussion with participants was encouraged during the explanatory stage to establish the participants' knowledge of RICS requirements and guidance and their views as to the general engagement of market participants with the sustainability agenda in general and energy efficiency in particular.
 - During this phase, the project team members allowed a free flow of ideas to promote discussion, especially in relation to the impact of EPCs.
- In phase two, participants were supplied with photographs and brief details of three or four residential units of different typologies, together with a limited range of data relating to each. They were then asked to

³ http://revalue-project.eu/wp-content/uploads/2019/01/Attachment_0-31.pdf

discuss what additional information they would require (gained by inspection of by request back to the client) together with the approach they would take to the valuation.

- o A decision was taken not to record proceedings in case this stifled a free flow of discussion but following the workshop all participants were sent a write up of the notes taken and asked to comment as to accuracy and to provide any further reflections that considered appropriate.

For a more detailed analysis of the findings of the roundtable discussions, please consult Deliverable 2.4, The impact of Energy Efficiency on residential real estate values: analysis of the findings of Round Table Discussions with valuers. This deliverable details the findings of the roundtable discussions and then discusses the implications both for the professional body and the REVALUE project findings. The deliverable is available on the REVALUE website here: <http://REVALUE-project.eu/wp-content/uploads/2018/07/D2.4-Final-Version.pdf>

1.2.2. Green & Healthy Homes Conference

21 October 2016 – Maastricht, the Netherlands

Partner: Maastricht University – Juan Francisco Palacios Temprano

RICS – Sarah Sayce

About: This one-day conference discussed the state of the art in research for financing products in affordable, sustainable and healthy housing. A total of 51 attendees participated in the one day conference at the University of Maastricht. The speakers were a unique combination of academics and practitioners in the area of sustainable real estate finance based in the U.S and Europe. The conference presented an opportunity for private sector investors and financiers to become better acquainted with the aims and progress of the Revalue project, to debate some of the big challenges facing the project and to make new relationships to help with next steps.

Audience number: N/A

Presentation details: RICS was a speaker on the panel on the Future of Green Financing and Maastricht University chaired the Healthy Homes panel.

Category: Commercial

1.2.3. Eco-Build 2017

7 March 2017 – London, UK

Partner: RICS – Sarah Sayce & Fiona Haggett

About: During the conference, decision-makers and influencers including architects, developers, local governments and infrastructure clients met to discuss construction, design and energy in the built environment. This edition focused on enabling sustainable construction for 2017 and beyond. REVALUE partners Sarah Sayce and Fiona Haggett took part of a performance lab with the global objective of maximizing performance and efficiency of buildings to meet COP21 targets for reducing carbon emission.

Audience number: 80

Presentation details: 'Connecting Building Performance and Value: The State of Play' – [presentation available here.](#)

Category: Environmental

1.2.4. EU Sustainable Energy Week 2017: Energy efficiency financing tools in the hot seat

22 June 2017 – Brussels, Belgium

Partner: Bax & Company – Rolf Bastiaanssen and Maarja Meitern

About: The Policy Conference is the most important European conference dedicated to sustainable energy policy issues. Sessions organised by the European Commission and energy stakeholders debate new policy developments, best practices and sustainable energy ideas, while networking events forge alliances.

Audience number: 20

Presentation details: REVALUE presented as one of three models for reducing the energy efficiency gap in a friendly competition – the REVALUE model focused on de-risking energy efficiency investments through large scale case study database.

Category: Policymaking

I.2.5. ABRACADABRA International Workshop 2018

8-9 February 2018 – Brussels, Belgium

Partner: RICS – Sarah Sayce

About: This event aims at identifying solutions to overcome potential constraints and hurdles of private property owners to engaging in energy efficiency retrofitting of their buildings by exploring the potential advantages of AdoREs. “AdoREs” is an acronym that stands for “Assistant buildings’ addition and Renewable Energy Sources” (AdoREs). It refers to a set of assistant building units – such as additions to the side, the top or façade or even entire new building constructions – potentially integrated with renewable energy sources.

During this event, the assumption that non-energy related benefits can play a key role in the deep renovation of existing buildings will be tested.

Audience/attendee number: 70

Presentation details: ‘Building the Value, some Reflections’

RICS’s presentation addressed the question as to whether or not energy efficiency improvements add value to domestic properties. Arguing that it is a complex issue, Sarah Sayce, a member of the REVALUE and EeMAP Teams, presented some of the findings from academic literature and from the REVALUE project which has examined the business case for energy improvements in social rented stock in Europe.

She further considered some of the reasons why the relationship between property prices and energy efficiency is not straightforward but make suggestions of where extra value can most readily be realised.

Category: Commercial

I.2.6. RICS UK Valuation Conference 2017

1 March 2017 – London, UK

Partner: RICS – Sarah Sayce

About: An annual conference within the commercial property, machinery and business assets, business valuation, trade related property and arts & antiques group. Highlights included key UK economic updates, benchmarked against global market conditions and predictions, as well as an update on international valuation standards and understanding the impending changes to the Global Red Book and the UK Red Book

Audience number: 100

Presentation details: The REVALUE project’s work on energy and value was presented to RICS members.

Category: Setting standards

1.3. Project end – January 2018 to February 2019

The final interactions with stakeholders in the REVALUE project were held with the purpose to test and discuss the REVALUE results in order to design recommendations for the key stakeholder groups. Two test group meetings were organised by the REVALUE team, one in United Kingdom and a second in Brussels. In addition, various dissemination activities took place (more details can be found in Deliverable 5.7 “Presentations at public events report”).

1.3.1. REVALUE Focus Group Meeting

16th February 2018 – London, United Kingdom

Partner: Bax & Company – Maarja Meitern

About: A discussion groups with representatives from social housing sector, lenders and valuers was organised. At the meeting the initial result of REVALUE workstreams were presented. The aim of the meeting was to test if the found evidence at the market by REVALUE partners, were also observed by the market participants.

Audience/attendee number: 20

Presentation details: REVALUE project initial results:

Financiers approach towards Energy Efficiency in housing, Corné Koppelaar, (Savills)

Energy Performance and Valuation of Social housing in Europe: a quantitative analysis, Juan Francisco Palacios Temprano (Maastricht University)

How valuers reflect Energy Efficiency in Europe, Sarah Sayce (RICS)

Long-term sustainable investment planning, Rolf Bastiaanssen (Bax&Company)

Category: Test group meeting

1.3.2. Implications for effective future policy on promoting energy efficiency in rented dwellings

22 June 2018 – Brussels, Belgium

Partner: Bax & Company – Maarja Meitern and Rolf Bastiaanssen

Maastricht University – Juan Francisco Palacios Temprano

Savills – Corne Koppelaar

About: The project partners presented the project's findings at a high-level roundtable with key stakeholders and discuss the implications for effective future policy on promoting energy efficiency in rented dwellings. Hosted by the EMF-ECBC in Brussels, the roundtable included representatives of UNEP FI, the European Commission, the European Parliament and TEGoVA. Four of the project partners will also be represented – RICS, Savills, Bax & Company and Maastricht University.

Audience/attendee number: 20

Presentation details: 'The impact of Energy Efficiency on residential real estate values: analysis of the findings from roundtable discussions with valuers'

As part of the REVALUE project, roundtable discussions were held across Europe with practising valuers over the summer of 2017. Three workshops took place in England (London, Birmingham and Manchester) and three in mainland Europe (Amsterdam, Barcelona and Berlin). In total, some 25 RICS registered valuers working for a range of valuation consultancies participated. Each workshop took approximately two hours and involved discussion partly stimulated by consideration of example typical properties. The purpose was to establish the extent to which valuers were examining energy efficiency as part of their due diligence process and reflecting it within their valuations.

Category: Test group meeting

Chapter 2

Dissemination to Real Estate industry

2.1. Presentation at EURHONET

On October 5 2017, the relevant REVALUE findings were presented at the Eurhonet Sustainable Construction Topic Group Meeting in Brescia & Bolzano, Italy which was held over three days.

REVALUE project representative, Jill Spaeh, of LUWOGÉ consult in Ludwigshafen, Germany shared insights on how the calculated results, (from the data provided by housing companies) can be applied to methodologies used when buildings are being appraised. Applying the results from the energy consultants may then impact the market value of the buildings.

The lecture, titled 'Energy Consultant's Results used to Develop Market Value' was delivered to leaders in the housing and construction industry from 5 countries around Europe. Attendees included key stakeholders from both public and social housing companies, energy consultants, architects and engineers from France, Germany, Italy, Sweden and the UK.

The lecture brought to light how results from energy consultants provide reliable performance information which should be beneficial in a valuer's Discounted Cash Flow (DCF) method of valuation. The lecture addressed how a portfolio's risks may be reduced. It was demonstrated that, with the information provided by energy consultants, the risk assessment which may be mediated.

The REVALUE work raised high interest and conversations from the audience. In particular architect, Thilo Cunz, from Germany asked to see a 'simple' example of the DCF, playing with the different energy use options. Christian Plagemann, a key stakeholder from Gewobag housing company in Germany and representatives from ÖrebroBostäder housing company in Sweden both noted the complexities of the DCF. There are several variables within the DCF calculation which each valuer needs propriety information. This information will influence the discount rate and is based on the risk assessment of the building.

Isaac Scaramella from Greenlab, Italy and host of the meeting also gained valuable insights. Mr. Scaramella is an energy engineer. He stated that he had never considered how his work might be included when a building was being valued. The topics of REVALUE were completely new for him and his fellow engineers. He found the work of REVALUE very relevant and is looking forward to the final reports of the project.

2.2. Distributions of Final Results and Findings

The following article was distributed after an initial briefing of the REVALUE project via personal contact or telephone call to the following people at the listed organisations:

1. DGNB - German Sustainable Building Council
2. DREEAM – Horizon 2020 Project
3. U.S. Green Building Council and LEED
4. BASF Group Real Estate & Facility Management

REVALUE Relevant Findings which impact the Valuation of Residential Buildings

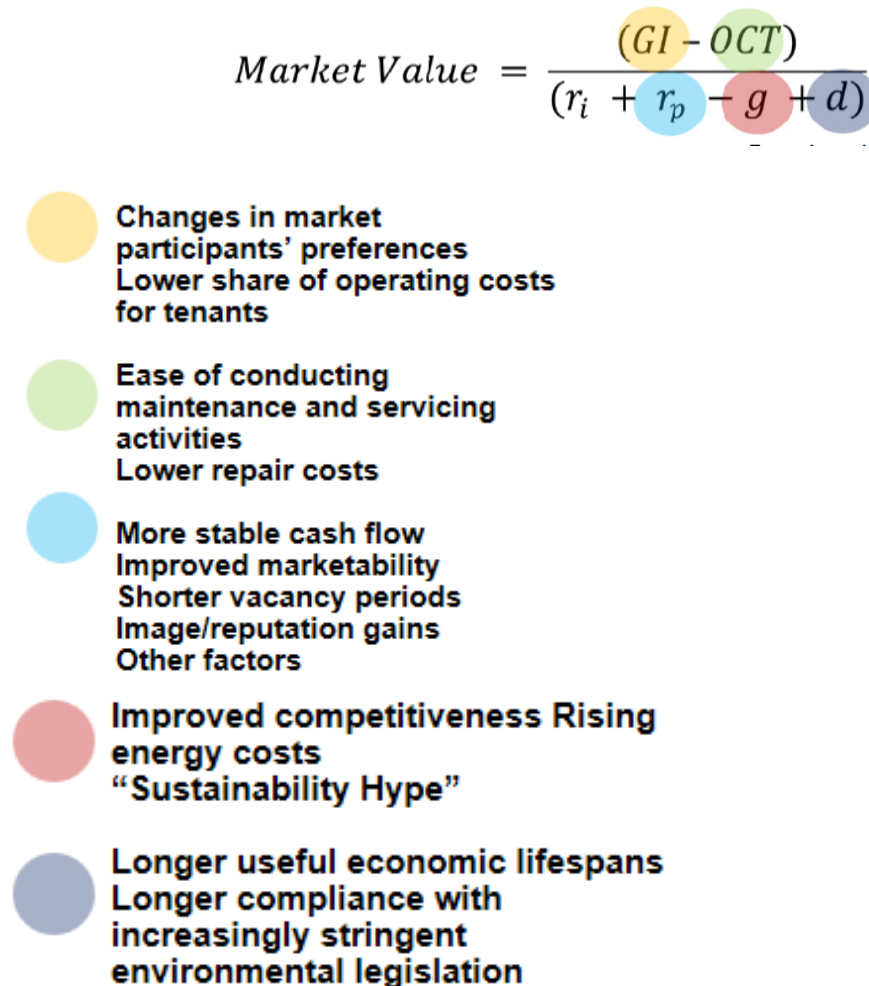
Within REVALUE, we have worked on assessing the benefits along with associated consequences and challenges of Energy Efficiency (EE). Among this we assessed the impact of energy use and associated impacts on the life-cycle cost analysis (LCCA). A significant part of the European housing stock needs to be renovated. More than 40% of buildings were built before 1960 and 90% before 1990. Older buildings are less energy efficient, due to the less stringent energy laws, fewer regulations regarding energy efficiency and materials not geared towards environmental issues. The current renovation rate is low, only about 1-2% of the building stock renovated each year.⁴ This contributes to the slow reflection of EE in new and renovated buildings by valuers.

⁴ [http://www.europarl.europa.eu/RegData/etudes/STUD/2016/587326/IPOL_STU\(2016\)587326_EN.pdf](http://www.europarl.europa.eu/RegData/etudes/STUD/2016/587326/IPOL_STU(2016)587326_EN.pdf)

REVALUE has identified several gaps in the knowledge, transfer and uptake of energy efficient upgrades to existing building stock throughout Germany, The Netherlands and the UK.

The first gap identified is between the energy consultants and valuers. Energy consultants produce information for Life-cycle costs, but are usually not aware of how valuers apply these financial implications in valuation to produce a market value. The valuer is guided by training to typically use the Discounted Cash Flow (DCF) method when valuing a property. Data on energy consumption, CO² emissions, and water consumption can aid in more stability as energy costs and the hype over sustainability fluctuates.

Market values can be derived from elements which benefit energy efficient and sustainable strategies. The diagram below clarifies how parts of the DCF may relate to comparisons of different energy calculation results.



5

The second gap is that valuers also struggle to identify which interventions have the greatest impact on EE and how to apply this in their valuations.

When the asset manager/owner provides the valuer with a cost analysis of the building life-cycle, the valuer should focus on key elements from both the overall functions of a building and a building component level. Examples of building functions include operating and maintenance costs. The rationale is that these will provide information regarding the ease of conducting maintenance and servicing activities and possibly lower repair costs.

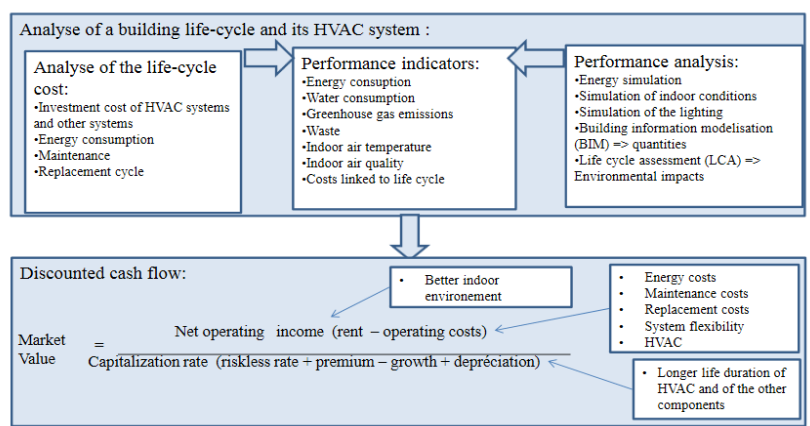
Regarding component level, valuers should look at results regarding component replacement, performance data and the combination of upgrades that have taken place. These results may benefit the DCF by making it more robust and can

⁵ Journal of Property Investment & Finance, Vol.29, No.6, pp.644676

add confidence when a valuer calculates possible longer useful economic lifespans and longer compliance with increasingly stringent environmental legislations.

- On a building level:
 - o Operating costs
 - o Maintenance costs
 - o Energy consumption
 - o CO₂ emissions
 - o Water consumption
- On a component level
 - o Replacement cycle
 - o Performance data
 - o Combination of upgrades

Below is a diagram demonstrating the benefits of analysing a building life-cycle and the HVAC component, as an example for such an component analysis:



Source : REHVA guidebook 16

6

Another gap was revealed in data collection from housing portfolios, (i.e., existing stock). The type of information available from housing companies varied widely, between countries and geographical regions. This data is critical for energy consultants to assess accurately the energy demand and in turn life-cycle costs to help owners and investors design their renovation strategies.

It is estimated that renovation accounts for 57% of the total construction market, and residential buildings for 65% of the renovation market in 2015⁷. It is estimated that only 1% of the current renovations meet the definition of deep renovation.⁸

Smaller renovations happen more frequently and are often regarded as “anyway costs”. Anyway costs include standard maintenance and necessary repairs. Due to a lack of data, when major building retrofits coincide with regular maintenance, these retrofits often do not take advantage of the opportunity to push the renovation to a higher level of sustainability. An effort needs to be taken to identify areas for increased EE and sustainable measures during standard work and maintenance.

The owner/asset manager is the one who initiates the Life-cycle cost analysis (LCCA) and the valuation. It is therefore their responsibility to provide the most accurate and up-to-date information and data. Higher quality data, allow a higher quality and more accurate LCCA. Using the results of a Life-cycle cost analysis may lead to a more favourable discount rate.

⁶ Federation of European Heating, Ventilation and Air-conditioning Associations

⁷[http://www.europarl.europa.eu/RegData/etudes/STUD/2016/587326/IPOL_STU\(2016\)587326_EN.pdf](http://www.europarl.europa.eu/RegData/etudes/STUD/2016/587326/IPOL_STU(2016)587326_EN.pdf)

⁸ The Economist, 2013. Investing in energy efficiency in Europe's buildings. A view from the construction and real estate sectors

The most critical information begin with the configuration of a building. This plays an important role in governing the energy consumption of a building. The building configuration refers to the geometry of the building, its envelope and the surrounding areas. How a building is used (residential, commercial, industrial, etc.), its energy needs, and how that energy is generated. These characteristics along with some financial parameters, yearly building maintenance and operational costs also have an impact on the life-cycle assessment of that building.

- Building information
 - o Typology, year built, location
 - o EPC rating if available
 - o Useable floor area
 - o Number of units
 - o Number of stories
 - o Current building condition
- Building Envelope
 - o Type of wall and roof construction
 - o Type of window glazing
 - o Insulation System
 - o Geometry and material of roof
 - o Dates of executed renovations
 - o Schedule of planned maintenance and/or renovations
- Financial Information
 - o Yearly Maintenance costs
 - o Operational costs
- Building Services
 - o Type of heat generation
 - o Type of cooling generation
 - o Type of hot water generation
 - o Any Renewables

As everyone knows, 'a picture is worth ten thousand words'⁹. In addition to proper documentation in tables, pictures can help the energy consultant to assess the situation of a specific building. In the blink of an eye the energy consultant can quickly find answers in regards to building geometry, % of glazing, surrounding development and materials of a property.

The advice to asset managers and owner is to collect more and better data. A last question emerges then about the return on investment of such collection and data management.

Energy consultants understand there are both costs and benefits to renovation geared towards energy efficiency and sustainability. Gathering the appropriate data on existing portfolios and realizing that there is not a 'one size fits all' solution will aid us as we continue to improve our methods for developing investment worth. As methods improve, so will the accuracy of calculating the benefits and burdens of sustainable choices. These results may enhance legislation and drivers in innovative EE technologies. Ultimately, people living and working in the buildings and our planet as a whole will benefit.

⁹ 10 March 1927 Fred R. Barnard, of Printers' Ink