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The European Group of Valuers' Associations

EDITORIAL

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EU climate law will transform real estate. Valuation practice had better follow

The climate action tipping point for real estate finally came on 14 July with the European Green Deal legislative package.

It was more 'Big Bang' than incremental. Twenty years of legislation have given the Union nothing more than an obligation to energy efficiency renovate when the owner freely decides to undertake a renovation of a certain scale, an obligation to renovate 3% of the central government building stock per annum or, if that's deemed too hard, some fuzzy alternative action, an energy performance certificate (EPC) and inspection of heating and cooling systems. Small wonder that renovation in Europe stays at 1 to 2% of the building stock per annum and that most of that is light renovation, locking in energy inefficiencies for decades. The European Commission calculates that this kind of progress gets us to climate neutrality in about a hundred years.

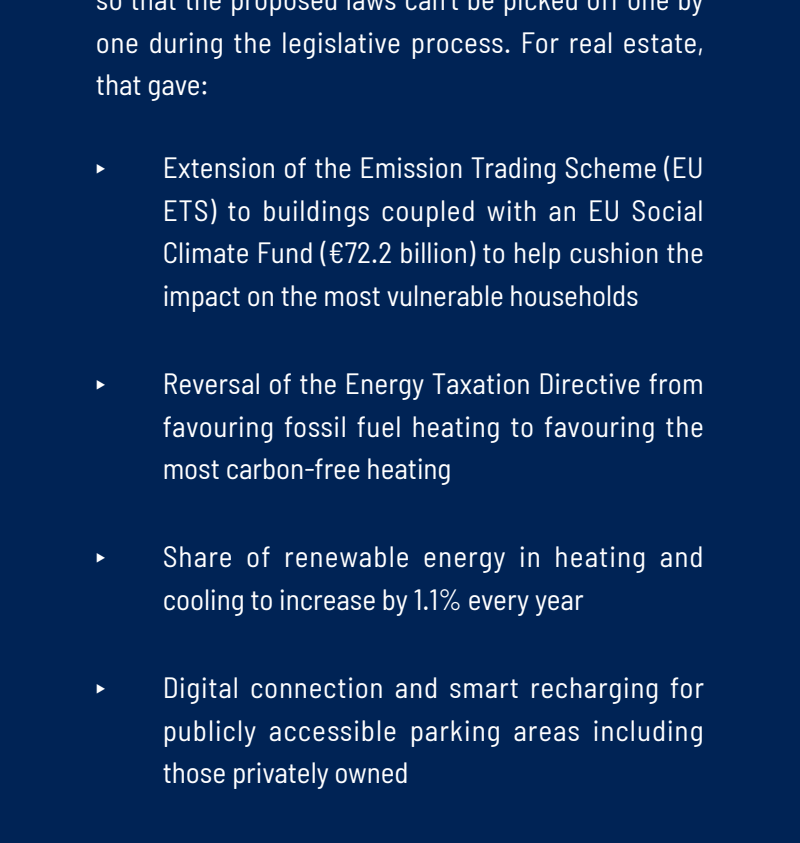
It's true that during that time the EU also set GHG reduction targets and that the target for 2020 was by and large met. But it and further targets set just three years ago didn't keep pace with climate warming.

That's why the EU just gave itself two new targets: climate neutrality by 2050, and a 55% GHG emission reduction by 2030 that changes everything, and the Commission is now combining them with proposals for binding legislation.

The coup for the Commission was to launch most of the 'Fit for 55' legislative package on a single day, so that the proposed laws can't be picked off one by one during the legislative process. For real estate, that gave:

- Extension of the Emission Trading Scheme (EU ETS) to buildings coupled with an EU Social Climate Fund (€72.2 billion) to help cushion the impact on the most vulnerable households
- Reversal of the Energy Taxation Directive from favouring fossil fuel heating to favouring the most carbon-free heating
- Share of renewable energy in heating and cooling to increase by 1.1% every year
- Digital connection and smart recharging for publicly accessible parking areas including those privately owned
- The existing obligation to renovate every year 3% of the building stock owned and occupied by central government is to be extended to 'public bodies' – which means all public bodies' buildings at every level: central, regional, local, including social housing – and extended to rental. Buildings under public ownership have to become nearly zero-energy buildings; buildings rented under a new contract have to be EPC 'A' or 'B' level. No more exemptions for heritage, military or ecclesiastical buildings and no more 'alternative approaches'.

And on 14 December, another law will top it all off by creating unavoidable renovation obligations for the worst performing building stock, public and private.



All that together is political dynamite, a pincer movement with owners and occupiers doubly hit by renovation requirements and by higher bills for existing heating.

You could expect the Council of Ministers to water these proposed laws down beyond recognition, as they have done so often in the past, but this time, there's a difference: the scientific, political and 'street' consensus that decisive action must be taken now.

Combine that with the fact that there's no more wiggle room, especially for real estate. The European Green Deal/'Fit for 55' package is about much more than buildings – it severely regulates industry, transport and farming and zeroes in on new forms of high carbon emission like the digital economy and call centres, plus a mechanism to ensure that third countries wishing to go on exporting to the world's largest trading power won't be able to undercut with carbon-heavy processes.

The overarching 55% GHG reduction target makes it impossible to 'shift' the burden from buildings to the other sectors, first because of the share of buildings in the overall equation (36% of EU GHG emissions and 40% of energy consumption), and second because the other sectors are being hit just as hard, causing rapid and hyper-expensive reorganisation of whole industries as we see for cars. It won't be politically or practically possible to increase their burdens to alleviate buildings.

Inside the building equation, the same law of political physics applies: extending the ETS to buildings will hit millions of people hard, even with subsidies and staggered deadlines. No politician will make ETS even tougher in order to loosen the regulation on building renovation.

Finally, the 'hit' for real estate will be even bigger than the '55%' GHG emission figure suggests, because the Commission estimates that, to reach an overall, all sectors included 55% reduction, buildings sector emissions will need to fall by 60% by 2030 compared to 2015 levels, with emissions in the residential sector falling by 61%-65% and in the services sector by 54%-61%. Building emissions were reduced by 18% between 2005 and 2017. They now need to fall at nearly three times that rate[1].

For real estate markets, it looks like the term 'stranded assets' is going to get new currency. For valuers, it means there will be no time for a gentle shift via small market value premiums for 'green assets' and small discounts for 'brown' ones. There'll need to be a rapid change of valuation focus.

EVS 2020 made a brave start at addressing that, but the profession will have to go farther, quickly. We make a start in this issue with a seminal article by Peter Sweatman who writes in his own name but has the unique insights that come from being rapporteur of the Energy Efficiency Financial Institutions Group (EEFIG), the Commission's key source of technical support for accelerating private finance to energy efficiency.

Michael MacBrien, Editor

1 European Commission findings quoted in 'Pricing is just the icing: The role of carbon pricing in a comprehensive policy framework to decarbonise the EU buildings sector – Regulatory Assistance Project, June 2021

#01
The real estate valuer – a new paradigm?

In most countries, valuations for the financial sector make up the lion's share of the valuation market, and Portugal is no exception.

Paulo Barros Trindade

With close to 2,000 professionals working in valuation, almost two thirds of real estate valuers practise in the financial sector, many exclusively so. However, with only two or three hundred new real estate valuers having arrived on the market over the last five years, the reality is that many valuers are already over 45. This means they belong to the generation that trained up towards the end of the 20th century.

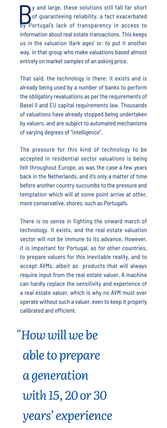
> "... , our profession is faced with an existential question: do we have a future?..."

Such valuers find it difficult to transition to the new reality, where the industry depends more and more heavily on technology in order to improve its efficiency and, in turn, its profitability. This, in a world where salaries have been stagnant for years or are only slowly catching up, while they are not in line with increases in other essential, valuation industry-related costs, such as fuel, toll charges, etc.

As the new millennium rolls on, our profession is faced with an existential question: do we have a future?

Until 2019, there was already a growing use of new technologies in the profession, with ever more software solutions becoming available for assisting with valuations, for example electronic platforms for monitoring service levels, and new AVMs emerging, most of which were designed to suit the situation in other countries such as Spain but, with rare exceptions, not really accommodating the Portuguese market.

However, when Covid-19 hit, this paradigm changed. Almost overnight, it was suddenly harder to make physical inspections of real estate, given the pandemic restrictions, thus creating a gap for new tech companies to emerge, whose core business focused on building mega databases on asking price and introducing data analysis algorithms to build AVMs.



By and large, these solutions still fall far short of guaranteeing reliability, a fact exacerbated by Portugal's lack of transparency in access to information about real estate transactions. This keeps us in the valuation 'dark ages' or, to put it another way, in that group who make valuations based almost entirely on market samples of an asking price.

That said, the technology is there: it exists and is already being used by a number of banks to perform the obligatory revaluations as per the requirements of Basel II and EU capital requirements law. Thousands of valuations have already stopped being undertaken by valuers, and are subject to automated mechanisms of varying degrees of "intelligence".

The pressure for this kind of technology to be accepted in residential sector valuations is being felt throughout Europe, as was the case a few years back in the Netherlands, and it's only a matter of time before another country succumbs to the pressure or temptation which will at some point arrive at other, more conservative, shores, such as Portugal's.

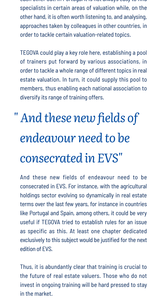
There is no sense in fighting the onward march of technology. It exists, and the real estate valuation sector will not be immune to its advance. However, it is important for Portugal, as for other countries, to prepare valuers for this inevitable reality, and to accept AVMs, albeit as products that will always require input from the real estate valuer. A machine can hardly replace the complexity and experience of a real estate valuer, which is why no AVM must ever operate without such a valuer, even to keep it properly calibrated and efficient.

> "How will we be able to prepare a generation with 15, 20 or 30 years' experience in residential valuations for dealing with other kinds of valuation?"

However, while accepting the fact that stand-alone AVMs are not a credible solution for the real estate market, it is nonetheless inevitable that AVMs will penetrate the market and, even if real estate valuers are still required, technology will replace many of them. This means that many valuers, particularly those working in the residential market, will require re-training in order to move into other areas of valuation.

This is where our profession faces its second big challenge. How will we be able to prepare a generation with 15, 20 or 30 years' experience in residential valuations for dealing with other kinds of valuation?

Let's not deceive ourselves - we will not all be able to remain in the profession. Those long-term residential valuers who can, will have to adapt to other sectors and learn new skills enabling them to undertake more complex valuations: for example, land for potential construction, commercial and service buildings, valuing companies and businesses.



Here we arrive at a fundamental requisite for any real estate valuer in the third decade of the 21st century: vision. People need vision to understand that times are changing very quickly and that, in a few short years, the professional reality described above will no longer be purely speculative.

So, any valuer wishing to have a medium term future in this profession must adapt, must train and must progress.

Gaining professional accreditation such as the RICS' TEGOVA is one possible route on this journey, but by no means the only one. Training is important, and this is where valuers' associations play a key role. We need to realise that gaining knowledge in valuation must be approached from a cross-border perspective so that similar associations in various countries can help each other out. In Portugal it is not always easy to find specialists in certain areas of valuation while, on the other hand, it is often worth listening to, and analysing, approaches taken by colleagues in other countries, in order to tackle certain valuation-related topics.

TEGOVA could play a key role here, establishing a pool of trainers put forward by various associations, in order to tackle a whole range of different topics in real estate valuation. In turn, it could supply this pool to members, thus enabling each national association to diversify its range of training offers.

> "And these new fields of endeavour need to be consecrated in EVS"

And these new fields of endeavour need to be consecrated in EVS. For instance, with the agricultural holdings sector evolving so dynamically in real estate terms over the last few years, for instance in countries like Portugal and Spain, among others, it could be very useful if TEGOVA tried to establish rules for an issue as specific as this. At least one chapter dedicated exclusively to this subject would be justified for the next edition of EVS.

Thus, it is abundantly clear that training is crucial to the future of real estate valuers. However, we do not invest in ongoing training will be hard pressed to stay in the market.

It is true that the profession is battling a numberof problems: the issue of low fees is common throughout most countries in Europe. However, it is vital to shake off the lethargy of a poorly paid sector, and to look for new solutions and positions on the market that can guarantee better profitability.

Our profession must recognise a reality that was thought to be on a 5- or 10-year horizon, but which has been precipitated by the pandemic. It is only a matter of time before financial bodies, in their ceaseless search to cut costs, integrate the new technologies on a large scale and start to the temptation of gradually replacing real estate valuers. From here it is a mere hop, skip and jump to persuading political decision-makers and regulators of the virtues and efficiency of these technologies.

Real estate valuers need to be one step ahead of this reality, which is looking more and more inevitable, and to get ready to join those who are willing to adapt in order to survive. As for everybody else, well... everybody else will be what the evolutionary process calls 'maladapted' and those who choose the selection process will naturally pass over in the future.

For Daniel Defoe, "The height of human wisdom is to bring our tempers down to our circumstances, and to make a calm within, under the weight of the greatest storm without". Our profession must take a leaf out of his book.

And on 14 December, another law will top it all off by creating unavoidable renovation obligations for the worst performing building stock, public and private.

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#02
The pandemic and recurring property tax
An English tale of woe

Andrew Hetherton *David Magor*

Introduction

In the United Kingdom, there are two recurring property taxes: the Council Tax for dwellings and the Non Domestic Rate for all commercial and industrial properties. They are critical elements of the economy, account for almost 4% of the Gross Domestic Product and have a joint annual yield of £60bn. The legislation and administration in England differ from those in the three devolved administrations of Scotland, Wales and Northern Ireland. Needless to say, Covid 19 had a significant impact on the levy of these taxes.

This article concentrates on the situation in England with the various measures taken by Government to alleviate the burden of the non-domestic rate during the pandemic and the consequences of this action on the valuation process.

A short history

Local authorities long had power to levy various 'rates' for local services. There are records of specific rates being levied in medieval times, but parishes were first required to levy a 'poor rate', for the relief of poverty, by the Poor Relief Act 1601, and other rates (for example for highways and police) followed. These locally levied taxes were merged into the 'general rate' in 1925, and this tax was levied, in respect of both domestic and non-domestic property, until 31st March 1990 to pay for services provided by local authorities.

The Local Government Act 1948 provided for the transfer of the function of valuation for rating from local to central authorities, General Rates ceased to be levied on 31st March 1990, and rating is now confined to the non-domestic sector.

The Local Government Finance Act 1988 brought the introduction of the community charge or Poll Tax (later to be replaced by the council tax from 1st April 1993) to replace the rate on domestic property.

How the non-domestic rating system works

Rates are levied on business properties on the basis of their rateable value and the national multiplier, and the amount payable may then be subject to a number of reliefs or exemptions. The rateable value (RV) of a property is the first element in the calculation of the rates bill. Rateable values in England and Wales are regularly reassessed by the Valuation Office Agency (VOA), which is now an executive agency of Her Majesty's Revenue and Customs. Normally the RV of a property reflects the annual rent that it could have been let for on the open market. The second element in the rates bill is the multiplier, which is normally expressed in pence per pound. The multipliers or the rate in the pound for England are specified annually by the Secretary of State (for the Home Department: = interior minister), subject to approval by resolution in the House of Commons. It may not increase by more than the rate of increase in the Consumer Price Index for the twelve months ending in the September prior to the year in question but this may be adjusted by the Secretary of State, if necessary.

The basic business rate liability for a property is calculated by applying the multiplier to the rateable value of a property where the multiplier is the tax rate and the rateable value is a measure based on the annual open-market rental value of the property. Hence, for example, a property with a rateable value of £100,000, where the multiplier was 51.2 pence in the pound, would have an annual business rate liability of £51,200.

The impact of the pandemic on local government finance

The pandemic has presented significant challenges for businesses in all sectors. The government's response has been of a similarly unprecedented scale. The support provided for businesses included 100% business rate relief for all eligible retail, hospitality, leisure and nursery properties for 2020-21, at a cost of £10 billion. Combined with those eligible for small business rate relief, this meant that more than half of ratepayers in England paid no rates in 2020-21.

At this year's [presentation of the] Budget, the Chancellor [finance minister] confirmed a further three-month extension to the full 100% business rate relief for retail, hospitality and leisure businesses, followed by a further nine-month period of relief at 66%, at a further cost of £9 billion. That took the total level of support provided to businesses by Government through relief from business rates since the start of the pandemic to over £16 billion.

How did ratepayers and their advisors react to the pandemic?

Rateable values are generally updated at periodic general revaluations - the most recent being in 2017 when rateable values were based on the rental value market at 1st April 2015 (known as the valuation date). The next revaluation was due in 2021 but is now planned for 1st April 2023 with a valuation date of 1st April 2021. It is at these general revaluations that the rateable value of a hereditament (rateable properties) and, therefore, rate bills, are updated to reflect changes in economic factors, market conditions or changes in the general level of rents. Between revaluations, the determination of whether something is a hereditament and its rateable value can only be changed to reflect "material changes of circumstances" including, for example, physical changes to the property or the locality.

> "Since the start of the coronavirus pandemic, the Valuation Office Agency has received a large number of 'checks' (a prerequisite to challenging rateable values and part of the appeal process)..."

This decision has created considerable dissatisfaction particularly because the valuation experts who represent the ratepayers had been negotiating with the Valuation Officer Agency and were expecting a significantly more generous settlement than the £1.5 billion being provided by the Government.

There is also growing anger at the tactics of the Government in passing retrospective legislation, which undermines the integrity of the tax particularly as there have been similar situations in recent years where exceptional events have not prompted such draconian decision-making. The proposed legislation is now passing through Parliament and there is a distinct possibility it could be challenged in the Courts or during the statutory approval.

Fundamental review

Government has also committed to a Fundamental Review of the Business Rates system even though the most recent changes only came into effect from 2017. The latest review is not only considering the frequency of revaluations but has also sought views on key issues including giving more discretion for tax rates to be fixed by local municipalities and looking at alternative ways of taxing non-residential property. An interim report was published in March 2021 along with a number of other tax-related reviews. Reviewing the present approach whilst providing significant support to businesses is presenting a number of challenges and risks undermining a system which for many has stood the test of time although now it seems could be another casualty of reflects from the pandemic adding uncertainty and confusion.

> "... the valuation experts who represent the ratepayers had been negotiating with the Valuation Officer Agency and were expecting a significantly more generous settlement than the £1.5 billion being provided by the Government."

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David Magor OBE IRRV (Hons) is Chief Executive of IRRV and Member of the Board of TEGOVA

#03 Assessing the value at risk in the energy performance of European buildings

Peter Sweatman

Buildings are responsible for 40% of the EU's final energy consumption and 36% of its greenhouse gas emissions. EU GHG emissions must be reduced to net-zero by 2050 and by at least 55% by 2030 under a legally binding target in the European Climate Law. To achieve this, in its July 14th "fit for 55" regulatory package, the European Commission has increased its target to reduce final energy consumption by 36% in 2030 versus a modelled baseline, and to put a carbon price on the supply of gas and heating oil to buildings from 2026. In addition, it is expected that a minimum energy performance criterion will be introduced to accelerate buildings renovation in an update of the Energy Performance of Buildings Directive later this year.

Europe has decided to tighten regulation in the face of the climate crisis, because postponing coherent climate action is both expensive and unfair to future generations. This regulatory tightening will have increasing impact on the value of buildings. In fact, in annex 3c of its new Sustainable Finance Strategy the Commission already states that measures to enhance energy efficiency of a mortgage collateral can be considered as unequivocally increasing property values. This article develops these trends.

Two ways of looking at value and energy efficiency

Energy efficiency upgrades are designed to reduce operational costs, they can improve a building's image and cut its use of primary resources. For the European Commission's Joint Research Centre (JRC) this provides the rationale for an increase in a building's value, and improved marketability[1]. In 2018, the JRC offered "a rule of thumb" pointing to an observed increase of 3-8% in the sale price of residential assets resulting from energy efficiency improvements, as well as an increase of around 3-5% in residential rents compared to similar properties. It also reported that this premium was over 10% in commercial real estate, all subject to country, region and building type.

1 Zancanella, P., Bertoldi, P., Boza-Kiss, B., *Energy efficiency, the value of buildings and the payment default risk*, EUR 29471 EN, Publications Office of the European Union, Luxembourg, 2018, ISBN 978-92- 79-97751-0, doi:10.2760/267367, JRC113215.

The 9th edition of the European Valuation Standards "Blue Book" (EVS 2020), published in November 2020, takes a more conservative view. While it states that highly energy-efficient buildings with low energy consumption, or properties with a recognised green certification, may begin to attract an additional value in some markets, it notes that any such "green premium" for efficient buildings may be replaced by a "brown discount" for inefficient ones as the market begins to expect such standards, or regulation requires them. Indeed, in valuation, timing is everything and guidance fit for the market of the 2040s, may not work as well in the 2020s.

EVS 2020 standard 6 also requires TEGOVA's 70,000 valuers to be aware of any future legal deadlines and inflection points, and when they will appear, to estimate the cost of a renovation deep enough, at that future time, to meet the required new level of energy efficiency then, and how these future costs will affect the building's Market Value at the date of valuation.

Buildings' energy transition risks and opportunities must be more visible to owners and valuers

Each building has a unique transition trajectory, depending upon its physical attributes and local environment. For larger buildings, the Carbon Risk Real Estate Monitor ("CRREM") offers a way for commercial buildings owners to see when its makes economic and regulatory sense to renovate, and identifies and reduces stranding risks at the building level. CRREM is already being used by asset managers owning over €300 billion worth of property covering 5 million square metres.

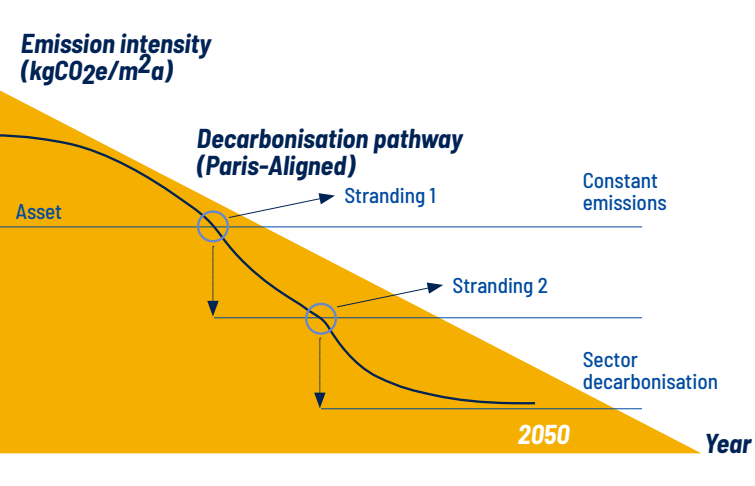
> *" A combination of minimum energy performance standards, carbon prices and taxes will exert growing pressure [...] which will be the economically rational decision at or before the "stranding point".*

Funded by the EU's Horizon 2020 Programme, CRREM provides science-based, location-specific carbon reduction pathways[2] for individual buildings. The calculations are valid for all buildings, and CRREM's mathematics could also sit behind a tool to help homeowners plan when a renovation will be needed to increase home efficiency to comply with upcoming EU Regulation and increasing carbon prices.

A combination of minimum energy performance standards, carbon prices and taxes will exert growing pressure to conduct net-zero aligned renovation works, which will be the economically rational decision at or before the "stranding point".

2 These are aligned with the Paris Climate Goals of limiting global temperature rise to 2°C, with ambition towards 1.5°C. GRESB. (2021). *Carbon Risk Real Estate Monitor* (CRREM). Retrieved from https://gresb.com/carbon-risk-real-estate-monitor/

The following diagram shows a typical asset (e.g. building) decarbonisation pathway to 2050[3], horizontal lines show current and future emissions intensities which are stranded as the regulatory environment gradually tightens emissions intensity requirements in line with a pathway dictated by Paris agreement aligned regulations:



3 CRREM. (2020). CRREM Risk Assessment: Reference Guide-User manual for the CRREM Risk Assessment Tool. [Website]. Retrieved from https://www.crrem.eu/wp-content/uploads/2020/09/CRREM-Risk-Assessment-Reference-Guide-2020-09-21.pdf

So is the "value" glass half full, or half empty?

Is value simply being redistributed between energy efficient buildings and inefficient ones in a zero-sum game? Is the sum of all green premiums equal to the sum of brown discounts, or is the overall market value of all European buildings increasing, or decreasing, due to energy efficiency improvements and lower bills?

EVS 2020 suggests that while "energy efficiency may be a virtue, a cost saving, allow a higher quality of working environment and be an aspect of a modern building which, as such, has lower maintenance costs, less need of refurbishment and may be in a more attractive location. Taken on its own, energy efficiency might not be the decisive factor in value."

A powerful way to answer this question is to see if the aggregate value of the cost savings resulting from building renovations is greater than the aggregate cost of those renovations.

In 2019, Europe consumed some 11 billion MWh of energy (990 Mtoe[4]), of which 4.4 billion MWh (40%) was used in buildings.

One third of residential buildings' energy use is gas, a quarter is electricity and the remainder is split between renewables, biomass, district heat and oil-based products[5]. European electricity has an average wholesale cost of around €50 per MWh, and an EU-average retail cost of €200 per MWh. Gas has EU-average retail price of €70 per MWh, and a historic wholesale price of around €25 per MWh. For approximation, assuming an even split between "gas priced energy" and "electricity priced energy", Europe has an annual buildings' energy bill of €594 billion[6].

Ignoring inflation, tax and carbon price increases, the present value of saving €594 billion per annum for ever, at a discount rate of 3% (the approximate average long-term mortgage rate for the last few decades[7]), gives a maximum EU renovation budget of €19.8 trillion. If two-thirds of the buildings' energy bill is allocated to Europe's 220 million households, the break-even energy renovation budget to upgrade these 220 million European homes is €13.2 trillion, or €60,000 per home. This per home budget will also increase when spread across just those homes which need deep renovation in their transition.

Extensive work commissioned by the European Commission in 2019[8], revealed that real deep home renovations (those saving some two thirds of energy use) cost on average 219 euros per m2. With an average EU27 home size of around 100m2, this gives a deep home renovation budget of €21,900. This is a very long way below €60,000, in fact it suggests that the present value of all future energy cost savings alone delivered by deep renovations is more than double the cost of renovation, assuming a discount rate of 3%.

This calculation does not consider the multiple benefits of energy efficiency, nor the very likely increased carbon prices for domestic gas use in Europe, which both improve the economics of home renovation.

4 Eurostat. (2020). *Energy consumption in 2018: Primary and final energy consumption still 5% and 3% away from 2020 targets.* Retrieved from https://ec.europa.eu/eurostat/documents/2995521/10341545/8-04022020-BP-EN.pdf

5 Eurostat. (2020). *Energy consumption in households: Energy products used in the residential sector.* [Website]. Retrieved from https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Energy_consumption_in_households#Energy_products_used_in_the_residential_sector

6 4.4 billion MWh multiplied by (average of Euro 70 and 200 = 135).

7 Euro Area Statistics. (2021). *Bank interest rates - Loans.* [Database]. https://www.euro-area-statistics.org/bank-interest-rates-loans?cr=eur&lg=en&page=0&charts=M..B.A2C.P.R.A.2250.EUR.N+M..B.A2B.F.R.A.2250.EUR.N+M..B.A2B.I.R.A.2250.EUR.N&template=1

8 European Commission. (2019). *Comprehensive study of building energy renovation activities and the uptake of nearly zero-energy buildings in the EU.* Retrieved from https://ec.europa.eu/energy/sites/ener/files/documents/1.final_report.pdf

Good value, but for whom?

If long-term, low cost financing (below 3%) is available for deep home renovations, they are great value. Yet, when their benefits are discounted at 10% (the discount rate used by the European Commission in its impact assessment of the recast of the Energy Efficiency Directive), the estimated break-even maximum deep home renovation budget comes down by 70%, leaving just €18,000 per European home.

Many homeowners "don't see the economics" of deep renovation, as their implied discount rates used to assess the benefits are much higher than 10%[9]. Yet this paradox can be rationally resolved by guaranteeing access for all European homeowners to cost-effective, long-term funding for deep home renovations. In fact, aside from neutralising the social impacts of the energy transition on the energy poor through providing grants to support their home renovations, the EU can work with retail banks to offer millions of unified EU Renovation Loans backed with public guarantees and linked to the buildings' value. EU Renovation Loans can work as the carrot when combined with mandatory energy performance standards and increasing retail carbon costs.

In conclusion, while EVS 2020 upgrades energy efficiency valuation to "Standard status" and advises valuers to integrate future regulatory costs (mandatory renovations) into their determination of Market Value, it is less firm in its view of the market's assessment of the future cost savings delivered by

> *" ...the EU can work with retail banks to offer millions of unified EU Renovation Loans... "*

those same renovations. This conservative approach is somewhat reflective of the pre-2015 accounting treatment of energy performance contracts by Eurostat[10] which insisted public authorities reflected all the service payment costs of energy performance contracts without accounting for any of the value of the delivered energy savings. It's as if Eurostat and EVS' standard require accountants and valuers to assume respectively that neither local authorities, nor building owners are able to contract for the delivery of energy savings. This could be construed to be a serious criticism of the European building renovation industry, and shows how important it is to prove the delivered cost reductions through energy efficient renovations, and not rely on deemed or design-estimated savings calculations.

Sustainability, energy efficiency and green features should indeed only be reflected in a building's valuation where there is observable market evidence. Yet markets are fickle and the impacts of property features vary over time, and between different sectors, cities and regions. Nevertheless, **with a present value of up to €20 trillion of future energy savings at play in moving to net-zero energy buildings, a €3 trillion renovation wave investment by 2030 will surely provide the evidence that valuers need to reflect efficiency premiums or discounts in EVS edition 10.**

9 Faurea, C., Gassmanna, X., Meissnerac, T., & Schleichab, J. (2016). *Making the implicit explicit: A look inside the implicit discount rate.* Energy Policy (97) 321-331. https://doi.org/10.1016/j.enpol.2016.07.044

10 European Commission. (2017). Eurostat Guidance Note: *The Recording of Energy Performance Contracts in Government Accounts.* Retrieved from https://ec.europa.eu/eurostat/documents/1015035/7959867/Eurostat-Guidance-Note-Recording-Energy-Perform-Contracts-Gov-Accounts.pdf/

Peter Sweatman writes as Chief Executive of Climate Strategy. While he is also the rapporteur of the Energy Efficiency Financial Institutions Group (EEFIG) comprised of over 500 members supporting the EU Commission, *and* for five years was the technical lead for the G20's Energy Efficiency Finance Task Group, the opinion here is his own.

#04

PME maintenance – How it affects value and how the valuer can verify it

Paulo Caldeira Martins

Plant, Machinery and Equipment has various aims, functionalities, work types, operational contexts and safety requirements that have a direct impact on its expected useful life.

Amongst other things, the useful life of PME depends on its use, wear and tear, and technological or economic obsolescence, due to changes to technology and changes on the market respectively. It also depends on the applicable legal constraints, such as environmental regulations and legislation.

One possible definition of useful life could be the period, as specified by the manufacturer, over which the equipment remains fully functional, provided that the maintenance plan is observed. In other words, the operating regime and the maintenance undergone by PME are linked to its state of repair. Useful life may vary when operating regimes and pre-defined maintenance practices change.

Maintenance is one of the elements that define physical deterioration, together with age and operating regime.

There are various depreciation methods that take these variables into account, making it possible to determine value.

PME is usually subject to defined maintenance practices: in some cases, these are mandatory. Maintenance processes are geared to enabling the creation of maintenance records and indicators that will provide the valuer with valid information and guarantees as to its condition.

Maintenance can be defined as a set of actions designed to maintain PME in, or restore it to, a particular condition, or aimed at ensuring that a particular service can be delivered.

There are various different PME maintenance principles: different approaches are taken over time in line with technological change. There are various maintenance standards due to the highly specific nature of PME: for example, maintenance standards relating strictly to lifts, escalators, aviation, or land-based transport.

Maintenance processes are applied depending on their ultimate objective, i.e. whether or not the PME needs more rigorous maintenance given its operating requirements.

Thus, PME maintenance may be divided between planned and unplanned maintenance:

1. *Planned*, i.e. scheduled within a given time frame:
   - Preventive maintenance aims to prevent and avoid breakdowns from happening;
   - *Systematic* maintenance is performed regularly according to units of time, such as hours or kilometres and performance.

2. *Unplanned*:
   - *Corrective maintenance* occurs after a breakdown is detected;
   - *Condition-based maintenance* looks at the actual condition of the equipment. For example, in aviation and railway transport, monitoring systems relay the condition of systems and sub-systems in "real time", predicting failures and communicating the condition to Centralized Technical Management (CTM) systems.

All maintenance approaches have what are known as "maintenance indicators". Maintenance indicators help to quantify the degree of maintenance to which the equipment was subject, its response, and its current condition in terms of reliability and availability. It is also possible to gain information on maintenance implementation (the plan), and whether or not it is behind schedule. These indicators, which must be included in PME maintenance logs, will certainly provide the valuer with a clear idea of how its condition has evolved, incorporated into its useful life.

Maintenance indicators also help the valuer by providing supporting justifications to be communicated to the client, as well as the options chosen in classifying the condition of the PME, and the respective determination of value.

Some indicators are specified below.

$$\text{Monthly availability rate } \% = \frac{\text{Time in service}}{\text{Mission Time (1)}}$$

$$\text{MTBF} \atop \text{(Mean Time Between Failures) } h = \frac{\text{Time in service}}{\text{Number of breakdowns}} \quad (2)$$

$$\lambda \text{ (breakdown rate) } = \frac{1}{\text{MTBF}}$$

$$\text{MTTR} \atop \text{(Mean Time To Repair) } h = \frac{\text{Total down due to breakdown}}{\text{Number of breakdowns}} \quad (2)$$

(1) The theoretical availability of the PME
(2) The numerator and denominator must have the same unit of time.

Other notable aspects indirectly related to PME maintenance and PME useful life include RAMS (Reliability, Availability, Maintainability, Safety) analysis, mandatory accreditations (regular inspections), standards, legislation, and the Machinery Directive.

RAMS analysis has recently emerged in the form of a document drawn up before a particular PME is supplied. It aims to assess its reliability, availability, maintainability, and safety at different phases of each life cycle. Initially developed as a design verification tool, it is now a kind of analysis applied to setting out requirements during the design stage, during regular operation, and at the end of its useful life and final disposal.

A RAMS analysis aims to guarantee that the PME runs correctly, that it will function well in the future, and that it can be maintained correctly within an acceptable time frame and budget, causing no damage to users and the environment should there be any operational irregularities. This analysis provides all parties (supplier, designer, client, owner, inspector, controller, valuer) with reassurance in the form of a comprehensive contractual agreement with the manufacturer/supplier regarding the quality of PME procured.

Figure 1 shows the relationship between the cost of preventive maintenance for PME and the costs resulting from failures. The higher the investment in preventive maintenance, the lower the costs incurred by failures and vice versa. The optimal point corresponds to the equilibrium between the two curves.

Figure 1 - Diagram illustrating the relationship between maintenance costs and levels

This document will justify the valuer's options, providing all the PME design data as relates to Reliability, Availability, Maintainability, and Safety.

To summarise: The valuer must assess the maintenance that the PME undergoes in order to obtain the following information:

- Description of maintenance practices to which the PME is subject;
- Degree of compliance with the maintenance plan;
- Maintenance indicators:
  - Reliability;
  - Availability;
  - Mean Time Between Failures - MTBF;
  - Mean Time to Repair - MTTR;
  - Other.

In addition, the valuer must check compliance with mandatory standards and legislation, as well as with the Machinery Directive and RAMS analysis, if applicable.

All these data will help the valuer to document the actual condition of the PME under valuation serving as the basis of the Valuation Report.

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