



“SMARTER Finance for Families – Improving Citizens’ Health Comfort and Financial Well-being by Supporting Banks, Residential Investors and Solution Providers with Green Homes and Green Mortgage programs”



D2.10 Brief guidance document for Property Evaluators



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Purpose

This deliverable serves to assist the creation and development of Green Homes & Green Mortgages programs for the implementing partners of the SMARTER Finance for Families initiative (SMARTER) with wider application to the whole of Europe as these programs expand. When banks plan to or begin offering “Green” mortgages and renovation loans, a market barrier was identified related to the need to modify standard real estate appraisal/valuation methodologies to consider the new approaches embedded in the design, construction or renovation, operation and decommissioning or repurposing of buildings. This is particularly important in countries with nascent green building markets as few valuation professionals are likely to have experience with this building approach and often lack the essential “comparables” of other local building projects whose sales prices help appraisers estimate more accurately a market valuation.

The following “Green Homes Appraisal Toolkit” is intended to assist valuers in recognizing green buildings and value the individual green elements and the entire green building in line with all the latest EU tools and relevant market best practices. It provides practical evidence relating to particular aspects of the valuation methodology for green buildings and emphasizes specific actions to be undertaken by valuers in order to realize an adequate valuation of green buildings.

This work benefited from a strong, existing relationship between the Romania Green Building Council (RoGBC), ANEVAR – The National Association of Romanian Authorized Valuers, Academia de Studii Economice din București - Academy of Economic Studies in Bucharest, and NAI Romania, a private real estate advisory firm specializing in the valuation of real estate. These partners had collaborated prior to the launch of the SMARTER Finance for Families Horizon 2020 project in May 2020 upon the request of RoGBC when the organization launched its Green Homes & Green Mortgage program in the Romanian market. The collaboration assisted the successful issuance of the first “Green” mortgages on the Romanian market as the involved experts were able to draw upon their understanding of green buildings, the related green building certifications, and “comparables” in similar markets to reach valuation levels and provide the necessary justification that was acceptable to the partner bank issuing those mortgages.

The SMARTER Finance for Families team selected the same consortium to develop a more formalized guidance document that has been shared with all partners to accelerate the necessary “Green” valuation capabilities in each implementing partner country. Additional expertise was provided by the Université Libre de Bruxelles and CRISCON, a building engineering consultancy focused on sustainable buildings, to review and provide additional content for the resulting document.

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Green Homes Appraisal Toolkit

Table of Contents

Introduction.....	2
Green Building Definition.....	3
Regulatory Norms.....	3
1. Decarbonisation.....	3
2. Climate Resilience	4
3. Energy and Mobility Independence	4
4. Resource Efficiency and Circular Economy	5
5. Architecture and Cultural Heritage	5
6. Nature and Biodiversity	5
7. Social Inclusion and "Fair Transition" for Everybody	5
8. Health and Well-Being.....	6
Particular Aspects Regarding Green Building Valuation.....	8
Valuation Methodologies and Approaches	11
Green Valuation Methodology and Approaches: Context.....	11
Cost Approach	12
Replacement Cost	12
Reconstruction Cost	12
Market Approach.....	12
Income Approach.....	13
Revenue	13
Occupancy.....	13
Operational expenses	14
Risk.....	14
Renovation Projects	15
Other Types of Value	17
Annex I: Certification Systems.....	19
Annex II: Toolkits for Financial Institutions and Residential Investors/Developers.....	20

Introduction

Climate change has accelerated over the last decades while scientists have been making numerous warnings about the deterioration and destruction of important biodiversity and ecosystems with substantial and uncertain socioeconomic and environmental implications that require immediate political action.

The European Union responded by updating and assuming a set of bold objectives promoting sustainability and resilience reunited in the new "European Green Deal"¹ Action Plan, aiming to transform Europe into the first climate-neutral continent by 2050. The building sector is, of course, both directly impacted by and crucial to achieving climate neutrality, which entails requiring and ensuring buildings and renovations² to be conducted in an energy, water and resource-efficient way. Its introduction is among the important objectives of the transformation of Europe into a climate-neutral continent. Climate-neutral building objectives are motivated by the important share of the buildings and related construction in the total carbon footprint of the continent. Scientific studies concluded that approximately 40% of the energy consumption in the European Union is attributable to buildings, and they are responsible for around 36% of the carbon dioxide emissions. In order to improve the energy performance of buildings, the EU has established a legislative framework that includes the Energy Performance of Buildings Directive 2010/31/EU (EPBD) and the Energy Efficiency Directive 2012/27/EU, which ultimately requires that new buildings be developed and realized as nearly zero-energy buildings (nZEB) while refurbishments include energy performance improvements.

Increased public recognition of the need for sustainable buildings and the implementation of underlying regulations result in shifting real estate market expectations towards increasingly strong preferences for green buildings. Therefore, valuers must take into consideration the full scope of green building features in their analysis and value conclusions.

The present guide is intended to assist valuers in recognizing green buildings and value the individual green elements and the entire green building in line with all the latest EU tools and relevant market best practices. It provides practical evidence relating to particular aspects of the valuation methodology for green buildings and emphasizes specific actions to be undertaken by valuers in order to realize an adequate valuation of green buildings.

¹ European Commission. (4 March 2020). Proposal for Establishing the Framework for Achieving Climate Neutrality and Amending Regulation (EU) 2018/1999 Available [here](#).

² European Commission. (14 October 2020). A Renovation Wave for Europe. Available [here](#).

Green Building Definition

The first thing people think of when considering green buildings is energy savings. However, the term green building encompasses features beyond energy efficiency which means, in other words, a highly energy-efficient building may not comply with green building requirements.

The Appraisal Practices Board defined the so-called "higher performance property" as the property that might use fewer resources, be more efficient, more healthy, more comfortable and more productive to its occupants and/or provide lower operational cost and ownership risk. This definition is useful in that it expands the energy-efficient building definition to require savings in all resources, not just energy. Though highly concerned about resource use reduction and indoor air quality, the wider-scope term "green building" is not equivalent to the term "higher performance building".

By the necessary mid to long-term approach the two perspectives share, the "higher performance property" term is also profoundly linked to the term "sustainability". A sustainable property is commonly acknowledged as a property enabled to create economic performance by not jeopardizing the standard of living for the next generations. The Royal Institution of Chartered Surveyors (RICS) defines sustainability as "balancing economic, environmental and social objectives at global, national and local levels, in order to meet the needs of today without compromising the ability of future generations to meet their needs". As we know, there is no long term economic performance without sustainability.

The European Union, in its European Green Deal, enumerates a series of objectives to be met by the European buildings in the future. They refer to a wide range of criteria which can be the basis for assessing the "greenness" of a building:

Regulatory Norms

1. Decarbonisation

The building is expected to produce as little CO₂ emissions as possible. Essentially, this requirement is related to the minimisation of the carbon footprint of the building. The goal is intended to be pursued with main reference to the:

- Planning and Construction phase: through the implementation of integrative design embedding life cycle approach and best available technologies and products related to resource efficiency, and:
- Operational phase: throughout in use stage by a sustainable mode of operating the building.

Life cycle carbon emissions of course span from the product stage (which contributes to the embodied carbon during construction, to sum to the so called "upfront carbon"), through use and maintenance, renovations and refurbishments, adaptation, till end of life. Replacements of course, contribute to embodied carbon over the buildings' life.

According to a World Green Building Council's 2019 report, "Bringing Embodied Carbon Upfront"³, embodied carbon contributes to around 11% of all global emissions. Most importantly, given the mitigation imperative we must consider, upfront carbon (emissions released before use) will be responsible for half of the entire carbon footprint of new construction between now and 2050.

Carbon neutrality can be defined for buildings and infrastructures as operational full life cycle carbon neutrality, depending on premises and purposes. Compensations are often key. Whatever the case, it is clear that we must aim at transforming our building stock towards carbon neutrality at a pace we've never seen to date.

2. Climate Resilience

Green Buildings are expected to significantly contribute to limiting the average long term global temperature increase to under 1.5°C (or at least well under 2°C) as per the Paris Agreement, to mitigate climate change. Now, climate resilience is in essence about the ability to withstand changed, more severe and frequent weather loads, being these direct (e.g. hurricanes, but also higher temperatures) and indirect (e.g. droughts, or even increased energy prices). A life cycle design approach is hence needed to ensure, for instance, that the occupants' thermal discomfort is falls within acceptable limits over the coming decades. That said, it is clear that a highly resource-efficient building, demanding less energy to run (even under a heat wave), less water to serve its users et cetera, can also be impacted at a minor extent and depth because of these increasing weather loads. On the other hand, green building do contribute in reducing climate change through the following means:

- Sustainable consumption of resources;
- Efficient waste management during their entire life cycle; and
- Implementing technologies able to maintain the well-being of its occupants in various economic conditions.

3. Energy and Mobility Independence

The Energy Performance of Buildings Directive as amended by Directive (EU) 2018/844 (EPBD), part of the Clean Energy for all Europeans package, has driven the Member States to implement national long-term building renovation strategies (path, policy measures and financing) to decarbonise their existing building stock by 2050. The criterion refers on the one hand to the requirement of realising as much any energy savings as possible and on the other hand to the need to incorporate renewable energy sources in the building in order to reduce its own consumption to the greatest extent possible.

The requirement also expands toward interdisciplinary areas, including the recommendation that building systems should help limit the overall carbon footprint by providing electric transportation facilities or other means of encouraging non-polluting transportation modalities.

³ World Green Building Council. (September 2019). Bringing Embodied Carbon Upfront. Available [here](#).

4. Resource Efficiency and Circular Economy

The efficient use of resources considers reuse and recycling whenever possible during the entire lifetime of the building. It refers to the design and implementation phase, when the use of recycled materials is welcome, and the implementation of recycling systems such as water and heat recuperators must be considered, but also to the operation phase when recycling is to be adopted by the occupants. With a design for adaptation approach, resilience can be increased over time reusing the heaviest, most carbon-intensive components. Eventually, buildings should be designed for their end of life, considering dismantling, materials recycling and, preferably, reuse via possible adaptation. The end purpose is of course minimizing the overall environmental footprint over time.

5. Architecture and Cultural Heritage

Europe is characterised by historical urban centres that maintain the original architecture and have an important inventory of ancient buildings with characteristics specific to the various historical periods. The resource efficiency and climate preservation requirements lead in this case to preferring refurbishment over new constructions. Of course, the need for preserving the cultural heritage leads to more sophisticated architectural and construction solutions, but the big scale urban planning must prevail over individual profitability interests and therefore one green criterion refers to preserving architecture and cultural heritage, while implementing green features to ancient constructions through refurbishment

6. Nature and Biodiversity

Though not directly related to buildings in general, this requirement has direct applications in the project phase, especially in the construction site choice, but also in the operation and disposal phases, when the use of the building and the disposal of the construction materials after the end of the useful life have to be done in respect of preserving nature and biodiversity. Also, green roofs and vertical green gardens are often directly relevant to preserve nature and biodiversity in urban areas. An indirect contribution is related to infrastructure serving urban areas, which are impacting these objectives.

7. Social Inclusion and "Fair Transition" for Everybody

The European Union also integrates social objectives in the expectations for green buildings. This criterion refers mostly to the national schemes put in place in order to achieve the long-term objectives of the European Union. Still it also refers to measures to be considered in the building and operation phases such as ensuring fair treatment of the workers and proper local workplaces for persons at risk.

8. Health and Well-Being

One important expectation regarding green buildings is to ensure better life conditions for their users. This requirement refers especially to ensuring better indoor air quality in terms of temperature comfort, lower indoor pollution (for toxic contaminants and allergenic components) and better ventilation (considering relative humidity, internal air change rates, and potential mould prevention), but also to diminish risks in case of emergency events such as fire, floods etc.

As the reader can easily notice, the green building concept is expected to consider a wide range of criteria. In an attempt to provide a comprehensive definition, we consider that a green building complies with high environmental, social and ethical standards during its construction and operation. Also, as business cases have been proving for a variety of building typologies and conditions, green buildings are the best choice for economic reasons and for all the concerned stakeholders.

It is also important to note that in terms of green building criteria, things change fast. The buyers and users have become increasingly demanding in recent years. The standard of today may fast become obsolete due to increasing rates of progress in terms of implementing technological building and building management systems. Hence, complying today to tomorrow's expectations (and codes) will make sense in decision making, since it increases a building value (and price point) over the coming years and decades.

The regulatory requirements presented below are not to be considered exhaustive, nor unchangeable. The only purpose for presenting them in short in this guide is to give the reader an idea of the present preoccupation of policy boards in terms of green buildings.

The most direct reference in the European Union regulation in terms of green buildings is the Energy Performance of Buildings Directive issued in 2010 and updated in 2018 (2018/844/EU). This Directive's transposition period for the Member States ended on the 10th March 2020. Among the most important statements in this regulatory act, we mention:

All new buildings starting 31 December 2020 have to be Near Zero-Energy Buildings. The same requirement was imposed since 31 December 2018 for all new public buildings.

- **Long-Term Renovation Strategies:** the need for all European Union countries to establish long-term renovation strategies that should be consistent with the EU's goals in terms of energy consumption and climate protection.
- **Minimum Energy Performance:** The European Union countries are expected to set cost-optimal, minimal energy performance requirements to be applied to all new buildings, to all major renovation works and to those refurbishment works referring to the heating and cooling systems and roofs or walls.
- **Automatic Temperature Control:** All new buildings have to be endowed with automatic temperature control systems in each room and these systems must be added in buildings undergoing major renovations.
- **Electro-Mobility:** Improving electro-mobility by setting minimal requirements in terms of charging facilities and other features for electric cars depending on the parking dimensions.
- **Energy Performance Certificate:** The certificate of energy performance is mandatory for any transaction regarding a property (sale, rent, etc.).
- **Financial Measures:** The European Union countries are expected to provide financial measures aimed at improving the energy efficiency of buildings.
- **Indoor Air Quality:** The recommendation for indoor air quality and ventilation quality monitoring.
- **SMART Technologies:** The recommendation for SMART technologies to be used in buildings in order to improve resource efficiency use (Buildings Automation and Control Systems). The

directive also introduces an optional European scheme for building "smart readiness" rating, the SRI (smart readiness indicator).

Other related regulatory acts include:

Energy Efficiency Directive (2018/2002) requiring energy-efficient renovations for central government occupied buildings and imposing exclusively the acquisition of Nearly Zero Energy Buildings by central public authorities,

The Directive on Renewable Energy³ facilitates the production of energy on the property throughout its own means, no matter the scale of it.

Regulation of the European Parliament and of the Council establishing the framework for achieving climate neutrality and amending Regulation (EU) 2018/1999 (proposed [European Climate Law](#)⁴). The last, as a regulatory act, will differ from the previous ones through its direct, mandatory character. It insists on two complementary aspects that are to be addressed: resource efficiency and adaptability. This approach emphasizes also the need to implement specific features that allow projects to better respond to future climate change consequences with minimal resource consumption, while preserving functions as well as occupant and user comfort and productivity.

Particular Aspects Regarding Green Building Valuation

Although the general approach of the valuation methodology are the same as for conventional buildings, the valuer needs to take a high degree of care and diligence in some particular aspects when it comes to green building valuation.

According to the general valuation principles, the valuer should possess the necessary knowledge and experience to perform a professional appraisal process. In the particular case of green buildings, the valuer has to be familiar with the technical features specific to green buildings and must possess a detailed knowledge of the technical progress in the field in order to understand and assess how green the building is.

The specific green building characteristics translate into market value to the extent they are responding to clients' specific requirements. Therefore, the valuer undertaking a green building valuation task must be familiar with trends in market preferences including the local market as well as specific segments of the real estate market.

Compared to the conventional building valuation process, the valuer should keep in mind that most green features are not observable during visual inspection, because they are implemented in hidden parts of the building or are related to the project or operation phase or relate to the construction

³ European Commission. (11 December 2018). Directive [(EU) 2018/2001] of the European Parliament and European Council on the Promotion of the Use of Energy from Renewable Sources ("Renewable Energy Directive"). Available [here](#).

⁴ European Commission. (17 September 2020). Amended proposal for a Regulation of the European Parliament and European Council for establishing the framework for achieving climate neutrality and amending Regulation (EU) 2018/1999 (European Climate Law). Available [here](#).

process. Therefore, the valuer needs to maintain close collaboration with the owner, manager and users of the building, as well as with the beneficiaries of the report and must require detailed documents that certify the implementation of the different, specific green features in the building design and construction.

The additional value of a green building compared to a conventional building is driven by two sources:

- **Interest of Buyers:** The interest of the buyers or tenants for those specific features such as energy-saving systems, “smart” components implemented, healthier and more comfortable and productive places. Their utility results from cost savings or increased comfort or productivity in this case.
- **Signalling Role of a Green Building:** The signalling role that a green building label comports. The green building label is associated in the clients' minds to a higher-quality, higher-value building, for which they are willing to pay a premium (and this is intertwined with the driver above). Moreover, though, in the case of commercial buildings, it is also a source of public image improvements for the users, contributing to their perception and reality of good corporate citizenship. Because of the signal associated with the greenness of a building, this second source of value is in the majority of the cases linked to the need for an objective assessment of the green character of the building. Therefore, the green building certification through independent and trustworthy bodies is in this case necessary.

Considering the elements indicated above, the valuer should explicitly require documents related to green building certification and consider them adequately during the valuation process. The valuer must keep in mind that if the building displays green building features, without being certified, the market may recognize an additional value, but it is usually significantly lower than in the case of certified green buildings.

The green building certification process is based on assessing greenness scores that consider various criteria, such as:

- Energy efficiency
- Materials and resources
- Water efficiency
- Indoor environmental quality
- Site efficiency and community
- Operations and maintenance

According to specific community concerns or certification types, supplementary criteria add to the above-mentioned ones. The highest scores indicate the building complies to a higher degree to the greenness criteria. The scores are also used to provide different certification degrees that help establish benchmarks on the market. For instance, the most well-known green building certification systems are LEED and BREEAM for Commercial property and Green Homes Certified by Romania Green Building Council for Residential property.

- **Green Homes Certified by Romania Green Building Council** provides the following certification degrees: **Certified, Excellent, or Superior**

- **LEED:** provides the following certification degrees: **Certified, Silver, Gold or Platinum.**
- **BREEAM:** provides the following certification degrees: **Pass, Good, Very Good, Excellent or Outstanding.**

Other scoring systems may also be taken into consideration if they are consistent with the perceived market trends and provided by independent organizations that implement specific quality standards.

The valuer accepting a green building valuation task must perform a thorough market analysis of the specific real estate market sector that should provide professional conclusions from a dual perspective, including:

- **Value of Green Features:** throughout the market analysis the valuer must establish how valuable the green features of a building are presently, considering the perceived clients' preferences at the time of the analysis.
- **Market Dynamics and Preferences:** the analysis should provide evidence for the dynamics of the market preferences and consider the long term. The valuer must acknowledge that concerning green buildings, clients' preferences change fast and the analysis should provide the tools for forecasting the strong and weak points of the valued building in the future.

The valuer should take into consideration that both the market and policymakers, throughout the public policies adopted in the field of sustainability, shape the clients' preferences and also the market trends. Therefore, one important consideration for the valuer in the stage of market analysis is to consult the relevant regulation but also the proposals or drafts of regulatory acts released by different public authorities for a forward-looking view. Also, the market development of certified green buildings generally follows common patterns in different countries following a market expectation curve which increases over time above code and policy levels.

The valuer is expected to be able to discern between those features of the building that bring additional value - being appreciated by the market - and other characteristics that, although costly, are not recognized by the market. The existence of such features not recognized by the majority of the buyers is called "superadequacy" and the valuer should be able to discern if this phenomenon occurs in the case of the valued building or if, in fact, all green features represent advantages of the valuation subject compared to other available real estate properties. This conclusion should consider the objective results of the market analysis including those regarding the predictable trends in market preferences.

If the valuer has good reasons to consider that the superadequacy occurs, it should be treated as a form of functional depreciation in the value estimation.

The rapid dynamics of market preferences raise supplementary concerns for the valuer. On one side, the valuer must keep in mind that the green advantages of a building can fade in the medium-term, with the mass implementation of the same features in the new buildings or through refurbishment. Basically, what represented an important advantage recognized by the market in the past may have become the norm over time and should not be treated as an advantage anymore.

On the other side, this dynamic may lead to a rapid obsolescence of other buildings that do not comply with the newly imposed requirements. In this case, a so-called “brown” discount is to be applied for bad performers, and even code level buildings when a policy or regulatory evolution is clearly envisaged.

The valuation report must contain specific clear provisions in which the valuer states what are the green features that the valuation subject displays, which are the certification or evidence documents it possesses and to what extent it complies to the present greenness standards recognized in the specific real estate market sector. The evaluation must be based on professional assessments such as the energy efficiency certificate and green certifications and must clearly describe the building compliance with specific regulatory criteria in use. For example, the valuer must mention if the building qualifies for property tax reductions according to the specific national or local regulation or if, due to its poor performance, its use is restrained (cannot be bought by or rented to public institutions, cannot be offered for rent, etc.).

The application of the valuation approaches in the case of green buildings though follow the same general methodology as in the case of conventional buildings; exhibiting some particularities that need to be dealt with great attention.

Valuation Methodologies and Approaches

Green Valuation Methodology and Approaches: Context

The technical and regulatory context of Green Buildings is presented in this document to provide the framework and guidelines for appropriate valuation of such buildings and assets that are developed. Key points of attention are detailed and valuation approaches as well as options, needs and expectation of the market are discussed to offer a comprehensive vision and practical tool to incorporate a particular type of valuation or particular valuation elements into conventional practice. Green Building rating/certification systems are discussed as often these tools are useful to be integrated into the valuation process and help characterise the greenness of a building.

The particularities of the renovation and retrofitting of buildings are considered as this is a key segment of the market in coming decades with the corresponding integration of green / sustainability parameters. This guide may offer key support in the development of the market embracing the wider uptake of sustainable buildings and in the development of Green Mortgages programmes; including those designed and promoted by the SMARTER finance for Families supported by the European Commission through the Horizon 2020 research and innovation grant program. This will eliminate potential barriers to the issuance of Green Mortgages if local property evaluators are not familiar with green building approaches not present or common in a particular market as the Green Valuation Methodology and approaches outlined here align current and developing green building approaches.

Cost Approach

The cost approach is based on the substitution principle as estimating the market value of a building is based on its replacement or reconstruction costs out of which all forms of depreciation will be deducted (physical, functional and economic).

In the case of green buildings, the valuer must use specific cost sources that include the incumbent green features specific to the valuation subject. In case such sources are not available, the valuer must substantiate the cost provided by the sources to the green characteristics of the property using appropriate cost benchmarks for the additional features.

Replacement Cost

A special mention refers to the use of replacement vs. reconstruction costs. If the adequate replacement cost is available, the recommendation is to use it in the valuation process, considering the adequate physical depreciation and the other forms of depreciation if necessary. Of course, the valuer is expected to detail in the valuation report the methodology for estimating each form of depreciation.

Reconstruction Cost

In many cases, only reconstruction costs are available for green buildings, due to the lack of adequate cost catalogues. If this is the case, the valuer should pay special attention to identify any forms of superadequacy and to treat them as forms of functional depreciation. The superadequacy can have technical or market causes. The first case is that of redundant building management and control systems that can result from implementing resource saving systems that are economically justified in other locations due to different climate or geographical conditions, but are not economically justified in the case of the valuation subject. The second case results from green features that are presently not recognized by the market. The valuer needs to make a deep analysis of the market trends before considering them as superadequacy forms, in which case, the reconstruction cost will be reduced by a functional depreciation equal to the marginal cost of implementing those particular features.

Market Approach

The valuer must pay special attention to market preferences in using this approach for green buildings. The attractiveness of green features in the relevant market must be carefully analysed considering the rapidly changing trends in this field as well as important differences between different national (or even regional or local) real estate markets and market segments.

In applying this approach, the valuer should consider comparable properties with similar features, and if this is not possible, careful attention should be paid to estimating the necessary adjustments. Pairwise analysis can be considered in these cases and cost estimations or income-based methods may also be applicable.

Considering the great variety of green features that can be applied to a building, the relative comparison method may be very useful in assessing the market value especially if green buildings are well represented in the specific market sector.

As the definition of a green building along with individual components of green criteria (space and water heating; air conditioning; insulation and ventilation; as well as lighting and appliances) are getting exceedingly careful consideration by institutional investors, the green labels can be taken as proxies for quality and level of green. The market is increasingly looking at the individual components of green rating criteria as well as the different levels of green certification to understand their impact on climate-related and environmental risk-types as well as a variety of financial risk types.

Income Approach

As the income approach is generally suitable for green building valuation, the most important inputs for applying it are those provided throughout the market analysis.

The input elements that are expected to reflect the green building features and how they are valued by the market participants are the following.

Revenue

The European market analysis provides evidence that users generally prefer green building due to the greater comfort provided, but also because they generally are associated with lower resource consumption. They allow users to be associated with a good corporate citizenship image in the case of companies. Such features allow companies to obtain a higher utility from better protecting the planet due to their scale while appealing to consumers who are increasingly environmentally conscious. Also, large evidence is available that productivity increases in green buildings, whether they are schools, hospitals or office buildings.

Therefore, the valuer is entitled to expect a higher market rent in the case of green buildings compared to their conventional pairs. The analysis must be performed distinctively on each local market and for each period considering the complex influences of consumer preferences.

Occupancy

The market value must take into consideration two aspects in terms of real estate occupancy. First, it is important to understand the present occupancy level and its driving factors and based on this information then estimate the most probable occupancy rate of a valuation subject in neutral market conditions. The valuer must be aware that multiple factors are influencing the occupancy rates, but green buildings are generally observed to display higher occupancy rates than their conventional pairs, all else equal.

Second, the valuer is concerned with estimating the future occupancy rates of the valuation subject and in this regard, valuers need to take into account that market preferences tend to favour green buildings to a greater extent, which may lead to an increasing differential in

occupancy rates between green and conventional buildings, all else equal. Therefore, when estimating the occupancy rate, the valuer may consider lower fluctuations in the case of green buildings, or even increases of the occupancy rate on limited periods, for building in high-density locations with relatively old stock of buildings.

Operational expenses

One of the most well-known advantages of green buildings is the resource savings they allow. The valuer should pay careful attention when considering the operational cost savings in discerning who is in charge of these costs: owners, tenants or other parties.

Energy efficiency certificate and any other resource efficiency certifications may be useful to the valuer when estimating the operational expenses, as they are related to energy and other forms of resource consumption,

A specific issue that should be addressed is the amount to be paid as property tax. The valuer should verify the specific regulation in order to understand if property tax reductions are in place or will be applied in the future for green buildings and consider them appropriately in the analysis. Generally, property tax is due by the owner of the building, but the lease contracts have to be studied for particular provisions in this regard.

Risk

The income approach embeds risk in multiple facets. As the methodology is based on annual cash-flow estimations for a long horizon, one important indicator that has to be properly considered is the risk related to the residual value of the property.

The valuer must be aware that green buildings are high-quality buildings that benefit from an increasing preference on the market given by customers' awareness but also by policy-driven changes in preferences. Therefore, it is a widely held opinion that they are able to better preserve their value over time. In estimating their residual value at the end of a given investment horizon, the valuer should consider a higher selling price than in the case of conventional buildings. The more the building integrates green features and responds to high green standards, the more it will be able to respond to future changes in preferences and reduce the decrease of its value over time.

The expected rate of return is another important parameter of the income approach that is significantly influenced by the greenness of a building. The valuer should pay attention when estimating it from the market information available, because it should refer to similar buildings in terms of green features incorporated and the real estate market sector in which they operate. Also, if from an evaluation angle, different IRRs should be compared (e.g. green vs non-green), from a buyer perspective a differential assessment can be made considering the additional cost of a green property and its benefits.

The estimated changes in market preferences towards green buildings, as well as the lower operational costs involved that ultimately reflect easier financing ability, are consistent with

a lower risk associated with green buildings and by this means a lower acceptable expected rate of return for investors. To better understand this reasoning, the reader may picture the green buildings as the blue chips of the real estate market, that is, put simply, as investments with favorable risk-return dynamics.

Renovation Projects

With an important stock of ancient buildings, the European Union pays special attention to refurbishing them in order to acquire green building features rather than constructing new ones. The approach is in line with several important principles promoted as it encourages:

- Resource-efficient usage;
- Protection of the architectural and cultural heritage;
- Circular economy framework; and
- Emission savings

This is why many European countries create the administrative, financing and taxation framework to encourage major renovations or refurbishments of ancient buildings that are compliant with the European Green Deal requirements.

In the case of refurbishments or major renovations, the Valuer needs to be aware that some features are easier and cheaper to implement in the construction phase, but can require important supplementary costs if added to existing buildings and some of them are even impossible to implement subsequently. The manner in which the existence of those features is considered in the value of the building should be in line with the valuation scope and the reasoning should be clearly reported by the valuer.

Among the most important provisions of the European regulation in this matter we mention the following:

- **Any major renovation should result in attaining the current energy efficiency requirements or in placing the building in a superior energy efficiency class.**

The present regulation is mainly centred on the energy efficiency performance of the building measured based on the quantity of energy needed for its operation in a given period, including heating, cooling, ventilation, lighting and hot water needs in a normal functioning regime. It does not clearly refer to green features, though the energy efficiency is generally a necessary condition for a building to be considered green. However, with the increasing constraints for the buildings to comply with environmental protection in all aspects of their operation, it is probable for other green features to be added in the minimum regulatory requirements in the future.

The major renovation is defined to comply with one of the following criteria:

- (1) the total cost of the renovation applied to the building's envelope or functional installations higher than 25% of the building value excluding the land contribution or

(2) more than 25% of the surface of the building envelope is the object of the renovation works.

The valuer can be required to establish if a renovation corresponds to the major renovation definition and to estimate the efficacy of a certain type of intervention considering the requirement presented above. Under the first criterion, the valuer should perform a market valuation of the building and a separate valuation of the land in order to compare the renovation cost with the value of the building exclusive of the land contribution.

In the second case, a simple surface measurement is necessary, taking into account all components of the building envelope, including windows and rooftop. In some cases, the analysis should be made in terms of value added by the renovation works that must be equal to or higher than the building value computed after deducting the land contribution to the market value.

The valuer should know the criterion adopted by the member state in which the building is located and must require the information necessary to establish if the proposed renovation works eligibility of the building for a superior energy efficiency class. If they are not sufficient, the valuer should warn the beneficiary in order to make the necessary changes to comply with the regulatory requirement.

- **The need for new buildings or those that are the object of a major renovation to encourage electromobility by respecting minimal requirements in terms of endowment with electric car chargers.**

The present regulatory provisions require non-residential buildings with 10 or more parking places to have at least 1 charger functional and to implement the necessary systems in order to be able to install at least 1 charger for every 5 parking places. Further provisions will be released for buildings with more than 20 parking places. The residential buildings should have the necessary infrastructure to be able to install chargers for every parking place.

The present regulation in force mentions that the requirements above are mandatory for renovations that refer to the parking areas or their installations and are not applicable if the dedicated cost for providing the minimal electromobility features is greater than 7% of the total renovation cost.

The valuer should consider these regulatory provisions, and all possible and complementary regional or local regulations, in the valuation process and make a clear description of how the building complies with the regulation in place or mention if it is exempted from it.

There are specific cases for which exceptions apply, such as the buildings designated for religious purposes, the buildings of architectural or cultural value for which the issuance of an energy efficiency certificate and/or the compliance with energy efficiency requirements would result in affecting the architectural or cultural valuable elements, the buildings with a future usage limited to less than two years, the residential buildings destined to a limited use during the year of not more than 4 months or individual buildings with a surface of no more than 50 square meters. The valuer should be aware that the range of exceptions may change

in time and the valuation report should refer to the regulatory requirements in force at the valuation date.

Other Types of Value

The green building valuation presents particularities also when estimating other types of value besides the market value.

- **Investment Value:**

For instance, **the investment value** should carefully consider the specific requirements of the user and analyse how the inputs presented in the 'Income Approach' subchapter above are influenced. The reasonable rent, the specific occupancy rate and void time after possible tenants leave, operational costs and the expected rate of return must reflect the specific conditions under which the investment value is estimated, but must be critically checked for reasonableness considering the specific context of a green building.

- **Equitable Value:**

The **equitable value** shall be estimated considering the possible synergies generated by the green characteristics of the buildings. The equitable value is expected to be based exclusively on those advantages that are perceived by the market, not considering those incumbent only to a specific person. Though in most cases they are also considered in the market value estimation, some particular cases may lead to the identification of synergies not fully integrated into the market value. One example is that of policy-driven synergies applying to specific categories of market participants.

- **Special Value:**

The **special value**, when necessary, is estimated taking into consideration the special advantages and disadvantages supported by a specific person and not obtained by any other possible participant to the transaction. After a detailed analysis of the specific preferences of the parties involved in the transaction, the valuer may find strong reasons to assign a supplementary value to elements that are correctly considered as superadequacy features in the market value estimation or to estimate lower special value than the market value of the building in specific cases.

- **Liquidation Value:**

When estimating the **liquidation value**, the valuer should pay particular attention to the sale conditions associated with the liquidation value to be provided, but must also consider the increasing market preference for green buildings and the low risk associated to them, which should normally lead to estimating the liquidation value on a more optimistic basis than for their conventional pairs.

In some cases, the valuer must estimate a special purpose value: the value for insurance purposes, the fair value for financial reporting purposes or the taxable value of buildings. The valuer who needs to estimate green buildings' value for special purposes must consider particular aspects.

- **Insurance Purposes:**

The value for **insurance purposes** is mainly centred on the reconstruction cost of the building. In this case, special attention should be given to particular green features that the building possesses and to the specific features that do not add to the market value of the asset (superadequacy), but are costly and therefore should be taken into account in the reconstruction cost. The progress in the construction techniques is to be considered in establishing the value for insurance purposes.

The valuer should also be aware that some features are cheaper to be implemented in the construction process, but become very costly to add to an existing building. Their appropriate consideration depends on the scope of the valuation report (estimation of the insurance value or estimation of the damages after risk occurrences).

- **Fair Value:**

In the **fair value** estimation, the particularities described for the market valuation apply. In very specific stances, if synergies are in place, the fair value may take into consideration special value components determined by the greenness of the buildings.

- **Taxable Value:**

The **taxable value of the building** is a special type of value required exclusively for taxation purposes that follows specific national regulation. It is significantly based on the cost approach and therefore the particularities described under the cost approach section must be carefully considered.

In most cases, the basis of the taxable value of the building is the replacement cost, in which case the superadequacy features are not to be considered, but the valuer must follow carefully the related national regulation. The report must contain clear provisions referring to any evidence regarding the certification as a green building or to describe if the building respects the formal regulatory requirements to benefit from property tax reductions.

Annex I: Certification Systems

LEED		BREEAM		SMARTER ⁵		DGNB			HQE	
							Total Performance Index	Minimum Performance Index		
Platinum	80+ Points	Outstanding	≥85	Superior	130-160	Platinum	≥80%	65%	Platinum (≥80%)	Exceptional
Gold	60-79 Points	Excellent	≥70	Excellent	100-129	Gold	≥65%	50%	Gold (≥65%)	Excellent
Silver	50-59 Points	Very Good	≥50	Certified	80-99	Silver	≥50%	35%	Silver (≥50%)	Very Good
Certified	40-49 Points	Good	≥45			Bronze	≥35%	-	Bronze (≥35%)	Good

⁵ The “Green Homes certified by Romania Green Building Council” is used here as an example with similar approaches described for locally adapted green residential certifications in the various implementing partner countries participating in the SMARTER Finance for Families project. See Annex II for detailed listing of green criteria within the Toolkits for each country.

Annex II: Toolkits for Financial Institutions and Residential Investors/Developers

SMARTER Finance for Families. Green Council Bosnia & Herzegovina. (2020). Green Mortgages and Renovation Loans: A Toolkit for Financial Institutions/Developers/Citizens. [here](#).

SMARTER Finance for Families. Bulgaria Green Building Council. (2020). Green Mortgages and Renovation Loans: A Toolkit for Financial Institutions/Developers/Citizens. [here](#).

SMARTER Finance for Families. Czech Republic Green Building Council. (2020). Green Mortgages and Renovation Loans: A Toolkit for Financial Institutions/Developers/Citizens. [here](#).

SMARTER Finance for Families. Energy Efficiency Centre of Georgia. (2020). Green Mortgages and Renovation Loans: A Toolkit for Financial Institutions/Developers/Citizens. [here](#).

SMARTER Finance for Families. Centre for Renewable Energy Sources (Greece). (2020). Green Mortgages and Renovation Loans: A Toolkit for Financial Institutions/Developers/Citizens. [here](#).

SMARTER Finance for Families. Irish Green Building Council. (2020). Green Mortgages and Renovation Loans: A Toolkit for Financial Institutions/Developers/Citizens. [here](#).

SMARTER Finance for Families. Green Building Council Italia. (2020). Green Mortgages and Renovation Loans: A Toolkit for Financial Institutions/Developers/Citizens. [here](#).

SMARTER Finance for Families. Polish Green Building Council. (2020). Green Mortgages and Renovation Loans: A Toolkit for Financial Institutions/Developers/Citizens. [here](#).

SMARTER Finance for Families. Romania Green Building Council. (2020). Green Mortgages and Renovation Loans: A Toolkit for Financial Institutions/Developers/Citizens. [here](#).

SMARTER Finance for Families. Slovak Green Building Council. (2020). Green Mortgages and Renovation Loans: A Toolkit for Financial Institutions/Developers/Citizens. [here](#).

SMARTER Finance for Families. Turkish Green Building Council. (2020). Green Mortgages and Renovation Loans: A Toolkit for Financial Institutions/Developers/Citizens. [here](#).

SMARTER Finance for Families. European Ukrainian Energy Agency. (2020). Green Mortgages and Renovation Loans: A Toolkit for Financial Institutions/Developers/Citizens. [here](#).