WORK PACKAGE 7

Intelligent Energy Europe

REPORT D7.3

Draft of TEGoVA Guidance Note No. 2 (GN2) for TEGoVA

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Work Package 7:	Comprehensive Review Process
Version of Report:	6th June 2010 (Version 2)
Full title of the Project:	Improving the market impact of energy certification by introducing energy efficiency and life-cycle cost into property valuation practice
Acronym of the Project:	IMMOVALUE
Agreement N°:	IEE/07/553/SI2.499204

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Project website: www.immovalue.org

Supported by RICS, MIT UNTERSTÜTZUNG DES lebensministerium.at, bmwfi Bundesministerium für Wirtschaft, Familie und Jugend

I. Table of Content

II. Abbreviations

ABGR..... Australian Building Greenhouse Rating

AI..... Appraisal Institute

API ..... Australian Property Institute

ASB ..... Appraisal Standards Board

BIM ..... Building Information System

BREEAM ..... Building Research Establishment Environmental Assessment Method

CASBEE..... Comprehensive Assessment System of Building Environmental Efficiency

CPD ..... Continued Professional Development

CSR ..... Corporate Social Responsibility

DCF ..... Discounted-Cash-Flow

DGNB..... "Deutsche Gesellschaft für Nachhaltiges Bauen"

EPBD..... European Energy Performance of Building Directive

EPC..... Energy Performance Certificate

EVS ..... European Valuation Standards

IPCC ..... International Panel on Climate Changes

IVS ..... International Valuation Standards

IVSC..... International Valuation Standards Committee

LCC ..... Life-Cycle Costing

LCCA ..... Life-Cycle Cost Analysis

LEED..... Leadership in Energy and Environmental Design

NABERS ..... National Australian Built Environment Rating System

RPI..... Responsible Property Investment

TBL ..... Triple-Bottom-Line

TEGoVA ..... The European Group of Valuers' Associations

USGBC..... U.S. Green Building Council

USP..... Unique Selling Proposition

WBCSD..... World Business Council on Sustainability Development

1 Introduction

This guidance note (GN) highlights some of the most relevant aspects of sustainability and its connection to property valuation. The environmental performance of buildings has always been a part of the valuation process as well as an integral part of the overall valuation results. However, recent market trends in the real estate industry demonstrate an increasing level of importance regarding the environmental performance and sustainability of assets. As a result of this new environment, the market values of products possibly represent their respective environmental performance more accurately now as compared to recent years.

Investors, developers and tenants are all key actors in assessing the energy efficiency of a building as part of environmental performance and the reduction of energy costs. Such actors have also started paying attention to various issues such as corporate social responsibility (CSR)[1], responsible property investment (RPI)[2] and ecological sustainable development (ESD). Interested parties are taking sustainability, especially energy-efficient building performance, into account as they weigh their investment or rental decision processes. Investor awareness and understanding have become considerably more evident. This change in practise has also been driven by the growing awareness of Climate Changes, high oil prices and rising energy costs; as documented in various studies.

Any attempt to develop clear measures and guidelines for the inclusion of sustainable features in property valuation must be flexible and future proof, since the importance and relevance of such features in the real estate market are still increasing.

While in some markets green features have yet to demonstrate a measurable impact, it is important that the valuer discuss all relevant aspects regarding sustainability.

Sustainability must be studied because most aspects regarding sustainability are long term developments, (e.g. energy price developments, exposure to environmental risk etc.)

[1] „Corporate social responsibility“ (Waddock and Graves, 1997) describes companies voluntary choice to integrate social and environmental issues into corporations daily business to behave ethical and improve social conditions by considerations about input (e.g. raw material sources), internal process (e.g. environmentally friendly production), and publicity (e.g. community relations) aspects.

[2] „Responsible property investment“ (RPI) defines investors choice to “maximize the positive effects and minimizing the negative effect of property ownership, management and development on society and natural environment” (Pivo and McNamara, 2005).

transparency of relevant input data, risk assessment tools and LCC-Tools and in-depth-analysis of relevant parameters, which are all becoming more relevant.

In an effort to inform the EU and other related shareholders about the various requirements and objectives of valuers, investors and the financial industry, TEGoVA would like to stream line the process by proposing a system wherein the energy certificates of a property bear market value. This new system could assist the EU in setting up a holistic policy toward the integration of the performance, certification and valuation of sustainable buildings.

Therefore, the primary purpose of this GN is to examine the issues and determine how we should proceed to meet our challenge, optimize our opportunities and ensure the best practices in the future. The GN therefore serves as a framework for the integration of environmental matters affecting the valuation profession.

2 Guidance Note for Integration of sustainability performance of property

2.1 Scope of Work and Limitations (for REV)

According to European Valuation Standards (EVS 3:3.2) a qualified valuer must be able to show "*professional skill, knowledge and competence appropriate to the type and scale of valuation and must disclose any factor which could compromise an objective assessment"*.

Therefore a qualified valuer has to

- Take into account rising market developments and circumstances that affect the property market as well as the valuer' own consideration within the valuation process, which ultimately lead to the valuer's estimation of the property's worth or value.
- Take into account a wide range of legislation regarding the environmental performance of buildings; this includes: planning policy, building regulations and energy certification of buildings (Directive 2002/91/EC).
- bBe aware of top line or bottom line improvements that have been undertaken or are required by a client to accord with corporate social responsibility policies. As businesses continue to operate in a more environmentally responsible manner, clients demand more relevant credentials proving the business commitment. Such credentials might include: a Carbon Reduction Commitment (CRC), accreditation that accords with ISO 14001 - the international standard for environmental management systems or EMAS, the EU wide Eco Management and Audit Scheme. A tangible example of such commitment by either party may be the existence of a "green lease".
- Account for all aspects that are affecting values and therefore reflect market behavior. Market state can be best reflected by using data that has been derived from the market using market analysis tools.
- Clearly state in the valuation report the environmental situation the property is exposed to even though this might not have an impact on values (yet).

Valuer´s must act within the limits of their professional skills. Hence, they do not carry out any investigation and expertise on properties' sustainability like BREAM or LEED-

certification-advisory, EPC calculation etc. In this respect the boundaries of their scope of work are comparable to already existing practices regarding environmental issues like the assessment of contamination, soil erosion etc. Nevertheless, the Continuing Professional Development (CPD) of a Recognized European Valuer (REV) requires the ability to judge the presented information of other experts in order to derive market values based on the experience of the valuer. Even though valuers do not produce/calculate the EPC they have to be able to understand the principals and effects of the figures on property market indicators (rent, yield, value).

2.2 Fundamental Challenge of valuing sustainability

2.2.1 General Discussion

The following chapters deal with the fundamental problems with "putting a value on sustainable or energy-efficient properties" as well as the obstacles which occur when buildings are valued with an appropriate premium or discount.

Generally it is difficult to attribute relative weights on different sustainability aspects, since their individual impact on actual sales prices can until today only been isolated with significant effort.

Concerning the correct integration of sustainable attributes into property valuation, three major difficulties can be identified:

- The valuer is just focussing on the assets value, which is reflected in the present value of future benefits for the owner of the property. Hence social welfare in general is not relevant. Therefore, a lot of features that are associated with "Sustainability" and "Green" cannot be relevant to the valuer as long as there is no internalisation of positive or negative external effects. This internalization can be carried out by policy makers through regulations, penalties, subventions, tax structures etc. Therefore, all socially intangible aspects that do not meet these needs are not (and should not be) reflected in property valuation.
- Energy costs are often addressed when communicating the benefits of green-buildings to customers. Nevertheless, energy costs account for only for approx. 1 % of the business operating costs while staff costs account for approx. 85 % of all business operating costs of an office tenant. The real estate industry has not yet addressed the

impact in the wellbeing of employees in green-buildings and the impact on their core business to a great extent. Therefore, the impact on rents and values of this major value drive is still limited. All of the benefits to the user of the property can only have a positive impact on real estate values if tenants show a higher willingness to pay (rent) which will only be the case if they understand that their internal productivity or other aspects might outweigh the additional occupational costs (here as total *costs in use*) compared to a non-green building by far.

- The third obstacle is the limit of market evidence. The question here is if the relatively fast market shifts were already processed within the traditional metrics; especially since market data is still very limited and comparables are rare.

2.2.2 Effects on the market (Willingness to pay for green-features)

For valuers, it is a challenge to isolate and define whether aspects such as energy performance, efficiency or a better green building rating (label) can be directly transformed into the (higher) market value of the subject property.

Before digging deeper, one must understand that there might be a gap between the technical aspects (e.g. investment for improving building equipment like HVAC or chillers, etc.) on the one side and the willingness to pay for such “greening” improvement by the tenant, property market, etc. on the other. It might, for example, be the case that the investments, improvement, integrated equipment etc. seem not to be fairly related to the achievable energy efficiency levels or market premium of that property.

The willingness to pay for green features might depend on market state, transparency, location, sector, exposure to environmental risk in the region, consumer awareness etc. Therefore, a general rule for discounts or premiums will never exist.

2.2.3 Evolution of green value

The introduction of gradually strengthening regulation (e.g. EPCs) for new and existing building stock will eventually lead to more sensibility concerning a building’s energy performance and efficiency. This means that labelling and certification systems using independent information will be used more often, regulations on energy codes will become stricter and subventions and tax relief might be applied when building energy-efficient houses – due to the internalisation of negative external effects.

Since markets shifted towards sustainability fairly quickly in some cases, market data in most regions is still limited. Increasing market evidence should further boost the differentiation between values of green and non-green-peers.

Nowadays, highly energy-efficient buildings with low energy consumption or a certified green property are starting to represent a unique selling proposition and therefore are likely to achieve an added value. However, the premium is likely to decrease over time and the "product" is likely to become a standard in the future. In the long run it is more likely that there will be a discount for non-energy-efficient properties instead of a premium for green or energy-efficient buildings.

All the above illustrated changes due to regulatory actions, building trends etc. will affect the quantitative impact upon property values. In summary, this implies that no general rule for the quantitative (numeric) impact that fits for all markets on property values, rents and yields can be given.

Furthermore, aspects like climate change are uncertain to a great extend and therefore the impact on value must be carefully analyzed.

2.2.4 Rising use of green building rating tools

In the last years a lot of new green building rating tools have been launched on various property markets in Europe. The development of implementation systems is higher if the label or certificate is compulsory (e.g. EPC, heat insulation ordinance) and not voluntary (like e.g. green building certification systems like LEED, BREEAM, DGNB). Interestingly, the labels were initiated both by government and partly by the industry. There are around 30 voluntary rating systems worldwide that try to meet the conceptual complexity of the term "sustainability" and to create standardized product identification and a seal of approval for green and energy-efficient buildings.

Unfortunately, most of these labels have only become important national- and regional-wide. Only a few "green rating" labels like BREEAM, LEED, Green Star, DGNB and CASBEE have gained international recognition and serve as a preferred standard for globally operating investors.

Due to recent developments in the field of sustainability and energy efficiency policies (e.g. introduction of EPCs), analysts expect that low energy or passive house standards become

both mandatory for the new building standard/code in the long run. Though it is unclear which way this evolution will affect the above stated enforcement of voluntary green building rating tools or if in the long run green building rating tools might lose importance.

In the context of property valuation, the questions arising in this respect are somehow identical as in the case of EPC. Valuers need to extract information that reveals and isolate figures and value drivers from to the energy efficiency stated in the label, which becomes the label's overall impact.

The transformation from label information to aspects that are directly relevant for use in property valuation is still limited. Furthermore, the EPCs and labels available in the EU vary considerable from state to state. These differences make comparison of information as well as the creation of a common framework difficult.

2.2.5 Rising sensibility for Corporate Social Responsibility

Further, the growing interest in corporate social responsibility (CSR) within the broader context of all corporate sustainability issues could be another driver for the aforementioned evolution.

CSR has become a normative standard that is concerned with the integration of environmental, social and economic business strategies and practices.[3] Therefore CSR describes firms' choices about inputs (e.g., the source and mixture of raw material), internal processes (e.g. the treatment of employees) and publicity (e.g., community relations).

Although sustainability is a principle within the philosophy of a company, it is still a voluntary commitment. However, an increasing number of companies integrate CSR as a key element of business plans and annual company statements. Besides key monetary data like turnover, internal rate of return as well as non-financial figures like e.g. the status of employee's illness or the reduction of CO_2-emissions can demonstrate the success of a company. These aspects enable not only a sustainable relationship with employees and clients but also the trust of investors and creditors. Prospective firms already know that intelligent clients also set up their buying decisions based on the eco-political and social engagement of their business partners.

[3] Cf. Jones, P., Comfort, D., Hillier, D. (2006)

Analysts expect that in the future large companies will be legally obligated to report their corporate social initiatives. In some countries, non-financial performance indicators are already regulated by law (e.g. financial accounting changing law in Austria).

2.3 Definitions

2.3.1 "Sustainability" in a broader sense (Triple Bottom Line)

The sustainability movement has been primarily driven forward by Climate change, the increasing number of environmental hazards and ecological disasters as well as rising oil prices. Consequently, a paradigm change on a broad scale throughout all industries has evolved and public attention is continuously rising.

According to these developments the sustainability topic have also found their way into the real estate industry and have inspired real estate academics and professionals to carry out scientific studies and surveys intensively. In these new market conditions, emerging terminologies such as "green building" or "sustainable building" have gathered momentum and are gaining importance.

The following is a short explanation of the general meaning of ''sustainability'' in order to facilitate an understanding of the consequences that the movement's rising importance may provoke within the real estate industry..

Even though the terminology of ''sustainability'' has existed for decades, the debates concerning the definition of the wide-ranging term are still in place. The most interpretation of sustainability encompasses the widely recognised and consensually accepted three main dimensions of sustainability[4]: namely ecological, social and economical characteristics and aspects. This methodology is also known as the "Triple Bottom Line", which has to be seen as a permanently evolving approach. The pillars of sustainability could be extended with the dimensions of technical and functional quality.

2.3.2 Definition of "Green Building"

To understand the widespread facets which define green buildings, one must establish a sense and sensitization for the meaning of what describes a green building. A "green" or

[4] Eklington, J. (1994), pp.90-100

"sustainable building" uses resources eg energy, water, materials and land more efficiently when compared to buildings that are simply built to existing minimum standards. They are efficient in terms of cost effectiveness and support healthier work, learning and living surroundings. They, therefore, increase comfort and productivity.

Green buildings also support the needs of the present without compromising the ability of future generations to meet their own needs. This means that the concept of green buildings also takes into account social, ecological and environmental issues and effects caused either by the property itself or the surrounding environment. Therefore, a broader definition relates more to potentially negative external effects and aspects of intergenerational justice that might arise.

RICS defines a green building as a property that "displays characteristics that minimise environmental impact through all parts of the building's life-cycle and focuses on improved health for its occupiers, optimise utility for their owners and occupiers and the wider public, whilst minimising the use of natural resources and environmental impact".[5]

A new standard (February, 2010) for the design of high-performance green buildings has been published by the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE), in conjunction with the Illuminating Engineering Society of North America (IES) and the U.S. Green Building Council (USGBC).

Standard 189.1, Standard for the Design of High-Performance Green Buildings Except Low-Rise Residential Buildings offers a meaningful definition; "a high performance green building is a building designed, constructed and capable of being operated in a manner that increases environmental performance and economic value over time, seeks to establish an indoor environmental performance that supports the health of occupants, and enhances satisfaction and productivity of occupants through integration of environmental-preferable building materials, and water-efficient and energy efficient systems"

2.3.3 "Green Value" terminology

In line with the ongoing debate related to the sustainability movement within the real estate industry, market participants questioned whether all aspects surrounding "sustainable" buildings could be properly reflected in the property's market value.

[5] RICS Valuation Standards Board (2008), p.5

Just as there are various green building definitions, there is no commonly accepted *"Green Value"* terminology.

Green value is the value difference between a green buildings compared to a non-green-peer.

After taking into account the findings from preceding explanations, the definition of RICS which describes the Green Value as the *"net additional value obtainable by a green building in the market"*[6] compared to conventional or non-green properties, seems to be the most accurate one.

This means that the Green Value represents an integral part of the overall market value. Both parts can only theoretically be separated.

2.3.4 "Green lease" terminology

In this context, it has to be mentioned that the rising concept of *"Green Lease"* arrangements has an impact on property valuation.

In general, a green lease refers to an emerging concept that integrates ESD, CSR issues etc. in the lease contract between owner and tenant of a sustainable/energy-efficient property. Green lease arrangements regulate various aspects mainly related to green or energy-efficient building standards, operational controlling and audit procedures related to energy performance measurements. The leases also relate to incentive and penalty clauses etc. due to agreed upon service and energy performance levels.

Green Leases are still in their infancy in the EU. There is no market definition of green leases, although their purpose is clear: to reduce the carbon emissions of occupied buildings. Green leases contain a framework of additional rights and responsibilities for landlords and tenants, the number and scope of which varies enormously. Some landlords have granted green leases with just a few basic green obligations, such as co-operation on energy-saving initiatives, provision of information on energy, water and waste, the use of sustainable materials, and prohibitions on harming the building's energy performance. At the other end of the scale there can be target-related provisions in relation to energy, waste and water, including separate metering, reports, rent review assumptions, alterations, reinstatement and the formulation of

[6] RICS (2005), p. 2

annual targets, perhaps even with financial incentives linked to the rent or service charge. We must consider inclusion of green leases in MERs, a Guidance Note and CPD for REVs.

2.3.5 LCC definition

Sustainability of a property is not a snapshot in time but must focus on the whole life cycle of the property. If one focuses on the Whole-life costs (WLC), all aspects including externalities and income must be analysed and transformed into a present value when carrying out an income method.

LCCA (Life Cycle Cost Analysis) consists of calculating the present value of all costs for the whole remaining life of a building (LCC, Life Cycle Cost) including the construction, operation, maintenance and end-of-life costs.

In some European countries there exist national standards and guidelines for carrying out a LCCA. At the international level, the ISO 15686-5 Buildings and constructed assets - Service life planning - Part 5: Maintenance and life cycle costing sets the frame. The ISO 15686-5, however, does not include a normative setting for an economic data structure which means that different approaches are in use in practice.

2.4 Qualitative integration into the valuation process

2.4.1 Integration in market research and site visit

To ensure a reliable judgment of the sustainability of a property, the valuer has to collect data related to the environmental aspects.

The collection of evidence might include EPCs, Green rating results (LEED, BREAM, DGNB certificates etc.), verification of potential contamination, exposure to natural disasters (avalanches, flooding etc.), the awareness of market participants towards sustainability in the given submarket, operating expenses, (green) lease arrangements, result from LCCA etc.

2.4.2 Integration in the valuation report structure

A valuation report provides the documentation of the whole valuation process and argumentation for the selection of certain input parameters for the calculation for any property being valued. This report is therefore incomplete if it does not cover the aspects of sustainability. Especially if quantitative market evidence cannot be isolated in not-transparent

markets, the superior respectively inferior level of sustainability of a building must be at least addressed in the descriptive parts on this issue in the valuation report. Such information regarding the subject property against its peers may at least support a customer's decision making process and increase transparency.

Sustainability and the underlying aspects such as energy efficiency might be incorporated in different existing chapters of an already existing report structure. However, a separate subsection should be included to underline the importance of the building's sustainability.

The main task is to increase transparency related to green features of the building being valued.

In the Annex of the valuation report the valuer should integrate the EPC results, LCC calculations and other existing documents.

2.4.3 Areas of interest

2.4.3.1 Energy efficiency (Energy Performance Certificate)

The EPC includes a broad variety of information connected to the energy performance of a building. For regression analysis the final energy demand seems to be the most appropriate measure.

The calculation direction goes from the demand to the source (e.g. from the building energy needs to the primary energy). For the assessment of the energy performance of buildings there are several energy performance indicators:

Energy performance indicator	**System boundary**	**Explanation**
Heat transfer coefficient (U-Value)	Building element level	Energy loss through building element
Net energy demand (heat demand, cooling demand, hot water demand)	Used rooms in the conditioned floor area	Heat to be delivered to or extracted from a conditioned space by a heating or cooling system to maintain the intended temperature during a given period of time, not taking into account the technical building systems
Final energy demand	**The whole building**	**Total energy, supplied to the building through the system boundary, to satisfy the uses taken into account (heating, cooling, ventilation, domestic hot water, lighting, appliances etc.), taken into account the technical building systems**

Primary energy demand	Building and energy production	Primary resource energy divided by delivered energy, where the resource energy is that required to supply of delivered energy, taking account of the resource energy required for extraction, processing, storage, transport, generation, transformation, transmission, distribution, and any other operations necessary for delivery to the building in which the delivered energy will be used.
CO2 Emissions	Building and energy production	Quantity of CO2 emitted to the atmosphere for the delivered energy

Table 1: Explanation of energy performance indicators

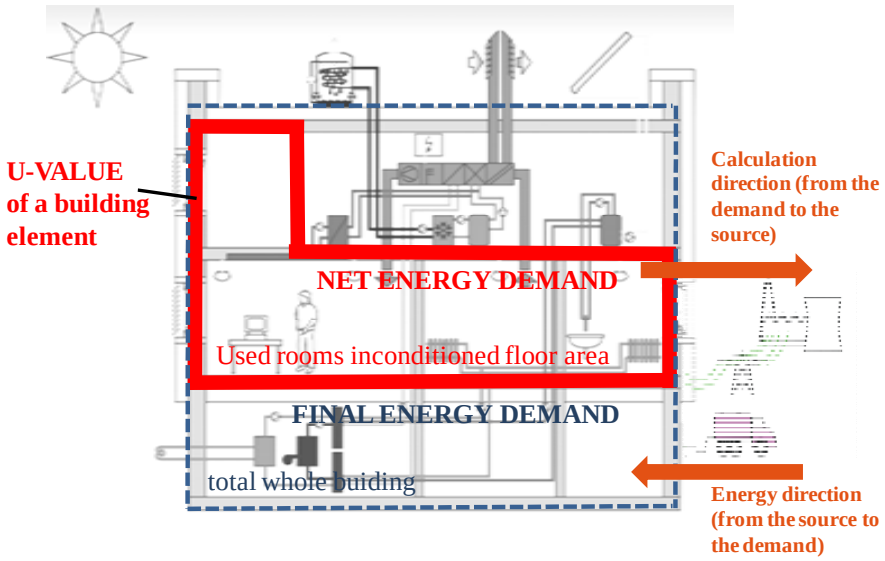

Figure 1: System boundaries for different energy performance indicators[7]

For the qualitative description furthermore the type of energy source, the corresponding carbon emissions and the security of the sources continuity are useful information.

2.4.3.2 Other Aspects

At the least, the valuer should show what advantages and disadvantages may arise due to the building components responsible for the green features of the building. In this context, the valuer should discuss and ultimately assess the following aspects:

1. Floor area in the terms of usability and cost effectiveness,

[7] DIN 18599

2. Insulation, its special features (e.g. heat bridges, type of windows, etc.) and continuity in terms of durability, regional and legislative building standards.
3. Water efficiency, especially in locations with scarce water supplies, using grey water, recycling of water, etc.,
4. The feasibility to replace or conduct remedial maintenance of building components (e.g. the upcoming economic effort to replace an oil running heating system against a pellet heater to reduce operating costs due to rising energy costs).
5. Age and quality (efficiency) of the technical equipment / Recommended measures for improving the buildings' energy efficiency,
6. Potential contamination of brownfield developments,
7. Exposure to natural disasters,
8. Impacts of LCA,
9. Impact on users productivity and wellbeing,
10. Eco-friendliness of construction materials,
11. (Likely) Development of energy costs,
12. Degree and complexity of building services,
13. Awareness of consumers / willingness to pay for green features,
14. Impacts of legal system and financial support (in case of planned new built),
15. Incorporate main results of existing rating results (EPC, LEED, BREMA, DGNB etc.),
16. Lease contracts (green-leases).

This list contains only a few examples. These parameters should not just be verbally discussed but their impact on value must be clearly isolated.

In principal, the valuer is able to use the existing building components and compare themto national and/or international building standards in order to illustrate which possibilities can be used to upgrade the building and it is facilities with respect tothe ongoing awareness of energy efficiency and/or sustainability of buildings.

2.5 Quantitative integration into the valuation process

Sustainability, energy efficiency, green features etc. may only be reflected in the calculation if observable market evidence exists.

There is no general rule for premiums or discounts. Impact on value of the same characteristic might vary over time, between different sectors/uses, regions etc.

The valuer must be aware of redundancies since green features might affect a variety of input variables in the calculation. In a first step, the valuer has to identify theoretical, possible starting-points for each valuation approach and then search for market evidence.

All existing valuation methods – mainly income, direct value comparison and replacement cost – are suitable for the valuation of sustainable buildings. Nevertheless the valuer could use advanced statistical methods, scoring etc. to facilitate the transparent and reliable integration. Lump sum discounts or premiums based on pure non-mathematical personal judgement are, in this context, not suitable.

In more developed markets advanced metrics might be applied. However, in less transparent markets where market evidence is hard to find a more simplified methodology might be more useful.

In any case, Comparable transactions are the best proof of the willingness to pay for certain building features. Transaction-databases hedonic pricing (multiple regressions) is an appropriate way to isolate green values in cases when it is available. This implies the extension of object information with sustainable characteristics.

Since transparent input assumptions and the development of future event as well as LCCA and risk analysis can be processed by DCF calculations fairly easily, this method seems particularly suitable for valuing sustainable buildings.

In general the following valuation parameters within the income valuation seem adequate for an adjustment related to green or energy performance aspects:

(1) Potential gross income

(2) Operating expenses

(3) Lease terms and tenant retention

(4) Remaining economic life-time

(5) Yield / Cap rates

There are different methods for integration of sustainability so far and are still under development (e.g. www.immovalue.org).

3 Conclusion

In the future, market evidence will be more visible. This transparency might lead to other possibilities to reflect sustainability/energy performance of buildings. Valuers and organizations have to support this transformation by aggregated-data-analysis for various sub-markets.

Legal disclaimer