

PROPERTY VALUATION AND ENERGY PERFORMANCE OF BUILDINGS – APPROACHES FOR INTEGRATING ENERGY PERFORMANCE INTO VALUATION PRACTICE

SVEN BIENERT¹, GERRIT LEOPOLDSBERGER², CHRISTIAN SCHÜETZENHOFER³; DAVID STEIXNER⁴

¹ KPMG Financial Advisory Services GmbH, www.kpmg.at
Adamgasse 23, A-6020 Innsbruck, Austria
Phone: +43 512 599 96 5321 / Fax: +43 512 599 96 5020
E-mail: sbienert@kpmg.at

² Dr. Leopoldsberger + Partner, www.leopoldsberger.de
Rheinlandstraße 62, 60529 Frankfurt am Main, Germany
Phone: +49 69 93999999-0/ Fax: +49 69 93999999-99
E-mail: leopoldsberger@leopoldsberger.de

³ KPMG Financial Advisory Services GmbH, www.kpmg.at
Kudlichstraße 41-43, A-4020 Linz, Austria
Phone: +43 732 6938 2267 / Fax: +43 732 6938 2153
E-mail: cschuetzenhofer@kpmg.at

⁴ University of Applied Science Kufstein, www.fh-kufstein.ac.at
Andreas-Hofer-Straße 7, A-6330 Kufstein, Austria
Phone: +43 5372 71819 129 / Fax: +43 5372 71819 104
E-mail: david.steixner@fh-kufstein.ac.at

ABSTRACT

With the Europe-wide introduction of the energy certification for buildings (Energy Performance of Buildings Directive, EPBD, 2002) the accurate assessment of the energy performance of buildings becomes increasingly important for property valuation. The energy certification is a means to predict the energy efficiency of a building and hence energy costs and the overall long-term investment quality of the building. With respect to rising and volatile energy costs and the fact that energy performance measurements such as energy certificates or life cycle costing (LCC) are a means to predict the energy efficiency of a building the impact of energy performance will potentially influence the market behaviour of investors, tenants and property owners. This paradigm shift and sensitizing for energy efficiency potentially will lead as well to have an effect on the property value. Therefore common ways and approaches for integrating energy performances of buildings into property valuation process will be the task for appraisers in the upcoming times.

To find possibilities for integrating these issues into property valuation practice the "Intelligent Europe programme" supports the IMMOVALUE project which was initiative by KPMG, Dr. Sven Bienert. Moreover the project aims to identify and integrate common energy performance and life cycle cost indicators in the property valuation process. Our first results give an insight of how measurements of energy efficiency an LCC as well as other sustainability and green building aspects in general could be integrated in the process of property valuation and how the introduction of EPC will change the real estate market.

1. INTRODUCTION

Due to the introduction of the Energy Performance of Buildings Directive (EPBD) in 2002 by the European Parliament and the Council one standard of the directive 2002/91/EC deals with the introduction of an energy certification for buildings. It reflects the building's energy efficiency and therefore supplies an overview about the building's energetic standard for prospective buyers, tenants, owners and occupiers. These energy certificates affect a majority of buildings and will be required whenever a building is constructed, rent or sold. With the introduction of this certificate buildings' energy efficiency becomes transparent and even laypersons can compare the energetic quality of buildings. Due to this new transparency a shift of consumers' awareness is expected which leads to an increasing demand for energy efficient buildings. The long-term goal is to substitute buildings of a poor thermal quality and enhance the energy efficiency of the buildings in the EU.

International valuation methods as well as national standards known in European countries were developed long before energy efficiency and performance were discussed. However, even in the latest version of the International Valuation Standards (IVS 2007) the aspect of energy (efficiency) is hardly

mentioned. In the revised EVS due for publication in 2009 there are also no connections to the above mentioned topics.

Therefore, appraisers find it hard to account for new developments and market-driven aspects like energy efficiency or other “Green features” within their calculations and valuation reports. Even though so far very limited research has been carried out regarding the linkage between green features and property valuation [1].

2. AIMS AND STATUS OF IMMOVALUE

This background given the project aims at securing and intensifying the market impact of energy performance certificates and life-cycle cost approaches by strengthening the link between energy performance of buildings and property valuation. This is reflected in the following specific objectives:

- (a) Preparing methodologies and useful guidelines for the daily property valuation practice thus ensuring that energy efficiency and LCC aspects are properly included in the calculations carried out;
- (b) Collecting and assessing property valuation approaches with a focus on identifying to which degree an integration of energy performance and LCC related indicators make sense;
- (c) Reviewing different approaches of EPC in Europe and trying to find common indicators which are suitable for integration into property valuation practice;
- (d) Drawing an overview of existing LCC approaches, including national differences, and selecting those common indicators that might fit for integration into property valuation;
- (e) Based on this a common methodological solution for an integrated appraisal approach.
- (f) Testing the established methodologies in pilot projects and getting feedback from key actors and decision makers in the real estate business.
- (g) Finally communicating and disseminating of the project results to financial institutions, banks and real estate companies, which represents customers of appraisers

The main output of the proposed actions are guidelines for revised standards of property valuation integrating energy performance and LCC aspects, which may serve as basis for further work in the relevant standardisation and training organisations for property valuation such as RICS, IVSC and TEGoVA.

The project was started in September 2008 and will be terminated in Spring 2010. The current status is the end of review of existing energy certificates in different states and the review of existing LCC approaches as well as the assessment of valuation methods with respect to possible linkages to LCC and energy efficiency.

3. WHAT MEANS “GREEN VALUE”

A *Green Building* is a property “that uses resources efficiently, reduce waste and CO₂ emission and provide superior indoor air and other qualities” [2]. A *Green Value* is the net value added obtainable by a green property in the market compared to a non-green peer group. In comparison the terminology of the *Market value* according to RICS and IVSC is the estimated amount for which a property should exchange on the date of valuation between a willing buyer and a willing seller in an arm’s length transaction after a proper marketing wherein parties had each acted knowledgeably, prudently, and without compulsion. According to the two given definition it can be assumed that the green value is an integral part of the overall market value.

In many available publications related to green buildings and their value the former belief that there is no connection between green-attributes and property value (known as the *Null-Hypothesis*) can already be proved as being wrong [3]. There are already few market results available showing that there is an impact of green features, but there are still a lot of obstacles.

Since markets shifted not gradually towards sustainability but fairly fast in some cases, market data is in most regions still limited. Even though Australia and maybe also America could be looked at as a positive exception, still experts claim that even in these markets relevant data is rare.

It is essential to understand two fundamental aspects before discussing green-values:

1) *Appraisers make no market*. Since the appraiser doesn’t “create” the market; he is looking for market evidence that could be used for valuation. So speculating what might happen in the future and trying to price in something that has not yet been quantified is not useful – in Austria for example some appraisers believe that it might be appropriate to add a value-premium to a property just because of the

energy certificate or a LEED-certificate in place, even though these certification itself has no direct linkage and influence on property valuation.

2) *Cost is not Value*: “Green cost” doesn’t necessarily lead to a Green Value and vice versa. This means that a sustainable property with identical cost to construct (and acquire the land) and identical LEED certification etc. can still have a totally different added value, just because the willingness to pay revealed by consumers in different markets might vary substantially. Therefore evidence from other markets concerning price variations might not be relevant anywhere else.

4. FUNDAMENTAL PROBLEM OF PUTTING VALUE ON GREEN

Concerning the correct integration of green attributes into property valuation we identified three major obstacles.

The first problem we call (1) *“Limit of System”*. The appraiser is just focussing on the assets value which is reflected in the present value of future benefits for the owner of the site. Hence social welfare in general is not relevant. For example if a LEED-certified property has just sourced its construction material in the neighbourhood it will get credits for this aspect since transportation was limited and pollutions likewise. For the purpose of a property valuation the geographical origin of identical material used is unnecessary and will be not judged in the valuation process. Therefore a lot of features that are associated with “Sustainability” and “Green” can not be relevant to the appraiser as long as there is no internalisation of positive or negative external effects. This internalisation can just be carried out by policy makers through regulations, penalties, subventions, tax structures etc. Therefore all social intangible aspects which do not meet these needs are not (and should not be) reflected in property valuation results.

Second we identified the problem called (2) *“Limit of Focus”*. Again intangible values are the core of this barrier. Looking at the following RICS figures, one problem might be that the green industry fails to address the most important benefits in a transparent way. All of the benefits for 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 compared to a non-green building by far.

The third problem we identified is called (3) *“Limit of Practise/Evidence and Methods”*. This area focuses on aspects the valuation industry itself must change. Therefore scientific research on these issues is the core topic of this paper. The main question is if the fast market shifts can be translated into the traditional valuation methods and input figures. Furthermore market data is still very limited and comparables are rare.

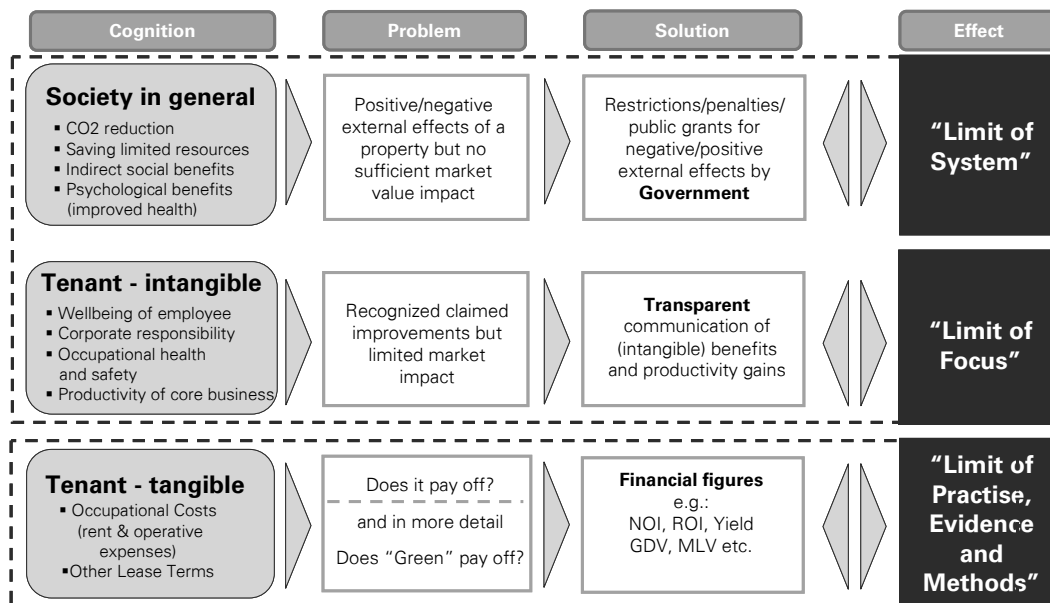


FIGURE 1: OBSTACLES FOR THE INTEGRATION OF GREEN PROPERTY FEATURES

The introduction of energy certificates as well as the green discussion in general and sustainability initiatives give all market participants a new impulse to break and solve the above stated problems. It is also the task of the valuer to improve the communication and understanding of all stakeholders within this industry by providing transparent reports [1].

5. PROPERTY VALUATION APPROACHES

5.1 General remarks

The following sections give a general overview of the three, usually applied, property valuation approaches. Of course, these approaches are applied differently in several countries, but all are subsets or variations of the following three fundamental methods: income related, cost related or value comparison approach. All approaches forecast future benefits of the property and try to convert this into a present value. Therefore we believe that *it is not appropriate to focus on the development of different approaches to integrate sustainability issues into property valuation on a country level, since the various valuation approaches are in their fundamentals identical.*

5.2 Income Related Approaches

Usually the income capitalisation approach is applicable to properties for which an active rental market exists. To value an income-producing property, an appraiser estimates the net rental income the property is expected to generate and converts this income into an indication of value by applying a rent multiplier.

Of course this very basic explanation might get much more complex in practical work when it comes to e.g. Discounted-Cash-Flow models or Term-and-Reversion method, but the underlying fundamentals remain the same: Convert expected income in the future into a present value. In general income related approaches are applied for buildings with complex and high diversified rent role such like offices, shopping centres, and residential buildings.

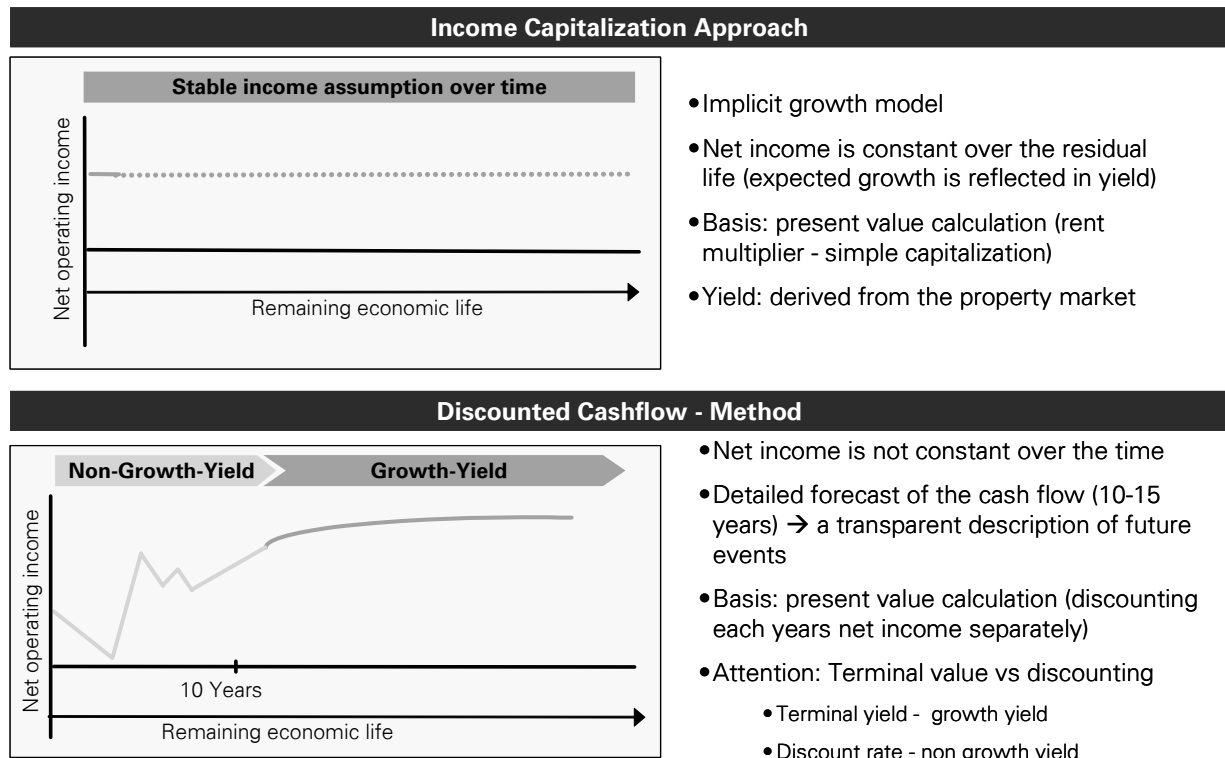


FIGURE 2: DCF- VS: INCOME CAPITALISATION APPROACH

Already at this stages the authors would like to point out that Discounted-Cash-Flow approaches seem to be an adequate instrument for the integration of just slightly changing parameters within income related valuations. It provides value estimation by discounting future income and outgoings per period and adds to this figure a terminal value after determination of the holding period, which is typically 10

years. The method is very accurate and transparent because it reveals all assumptions regarding the various input parameters.

5.3 Cost Approach

The effective capital value is the sum of the land value and the total replacement costs of a new building reduced by the accrued depreciation. Cost related approaches are applicable if there are no comparable values available and the property doesn't generate any income.

5.4 Value Comparison Approach

The precondition for this approach is the availability of comparable properties for the derivation of the (subject) properties' value. Several adjustments for the individual qualities of the subject property concerning age, date of sale, location, topography, design, contractual matters and other value influencing factors need to be applied.

6. PROPERTY VALUATION APPROACHES

The challenge for valuers is to appraise a new factor such like the introduction of energy certificates in an appropriate way. Even if the consequences of the introduction itself are not fully quantifiable at the moment, the integration of this new factor must follow a methodologically sound valuation practice. We identified five different ways within the income approach which offer possibilities for the integration of the energy certification/energy efficiency. In following figure, which shows the methodology of the income method, these five possibilities are marked.

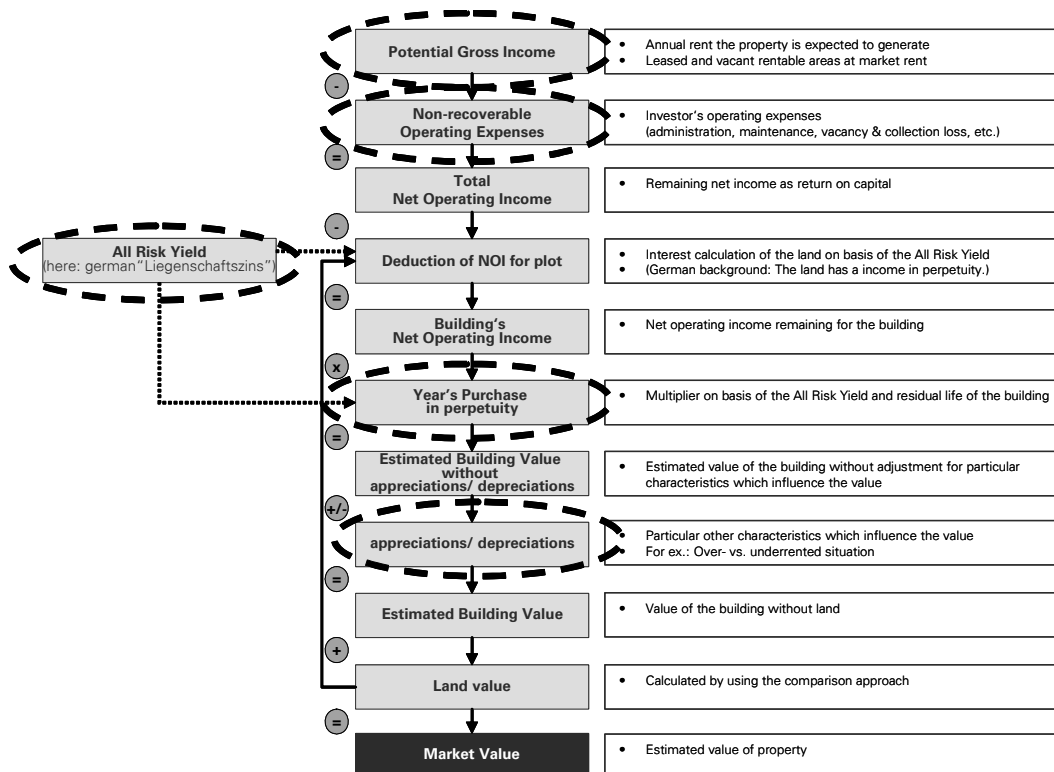


FIGURE 3: METHODOLOGY OF THE INCOME APPROACH

6.1 Adjustment of the Gross Income

The motivation for integrating the energy certification at this point of the valuation process is that the energy efficiency level of a building belongs to might influence the tenant's willingness to pay.

First and that will probably be the strongest argument: If tenants will have to pay a lower energy bill they might be willing to spend the delta on the rent (here the potential gross income). However one might argue that tenants will potentially bargain and that the reduction will just lead to reduced overall occupancy cost for the tenant but not necessarily to a higher rent for the landlord. Second, a higher

demand for buildings of a good energy efficiency level might lead to a higher tenants' willingness to pay just because these buildings are more "prestigious/desirable", while rents for buildings of a poor thermal quality tend to decrease. Again this aspect could also be criticized since first the question needs to be answered for how long the tenant might want to pay this premium, since every new product or idea will lose its "bonus" over time.

Very important is the fact that all this mainly refers to new lettings / new tenants. During the term of a rental contract there will be probably only in very few cases the chance to uplift the rent just because the thermal quality of a building has been improved. In a lot of countries more obstacles of this sort might arise. There could for instance be laws in place which prevent the owner from raising the rent for new leases if the house has a certain age.

To what extent the net rental income will rise compared to non-green comps is not predictable on a general level. However, since most markets until today do not reflect valid results concerning energy savings in the sense of higher revenues, valuers should not estimate this fact pro-actively by pricing in assumed reactions of the market. A fundamental principle behind this is that an appraiser must reflect the market reaction and current state but may not influence it. A pro active estimation of the effects might influence the market in an endogenous way. As long as nobody knows how the new transparency achieved by energy certificates will affect the market, valuers must observe and analyse market behaviour and derive persistently attainable rents for each property individually.

6.2 Adjustment of Non-recoverable Expenses and Vacances

The potentially lower vacancy rate will of course lead to higher overall revenues and could therefore be discussed in connection with the rental income. Moreover it will lead to a lower vacancy and collection loss which ranges e.g. in German speaking countries between 3 % and 4 % of the potential gross income. Since these expenses reflect the fluctuation and overall quality of tenants these aspects must be influenced. The effects we analysed above mainly refer to changes on the demand side of the market. On the other hand there are effects in context of energy certification which do not result from the market-side but from technical qualities of properties. Maintenance costs are an example for a technical influence and refer to the expenses of keeping a property in a good state of repair.

Maintenance costs have to be derived from the qualities and the condition of the technical equipment, independently from the energy certificate or energy efficiency itself. Therefore the integration of Life-Cycle Costing (LCC) might be an adequate method for achieving this aim.

6.3 Adjustment of the Yield

The derivation of the yield is one of the most important parts when applying the standardized direct capitalisation method as well as for other, non standardized approaches like e.g. the discounted cash flow method. The idea of integrating the energy certification at this point of the appraisal process is as follows: the new transparency concerning energy efficiency will change the demand side of the market to some extent. Buildings of a good thermal quality will have a lower risk concerning marketability while buildings of a poor thermal quality will probably suffer from lower rents and higher vacancy rates resulting from lower demand and therefore a higher yield. The attribute "Future proofed" against rising energy costs results in a lower risk profile and therefore lower yields. This argument is not redundant to higher income, since the likelihood of a better growth prospective needs to be reflected in the yield even so if at present income must not have changed to a great extent. On the other hand the appraiser has of course to avoid redundancies in his valuation.

6.4 Adjustment of Remaining Economic Lifetime of a building

The remaining economic life of a building is the period of time for which income can be expected in the future. Basically it can be extended by carrying out several refurbishments or reduced due to insufficient maintenance etc. The potential impact of green feature will be almost impossible to measure at this stage, but it is also necessary to mention that there will be a potential influence from the market side e.g. assuming that buildings of a certain poor thermal quality are not marketable in the future and this would result in a reduction of the remaining economic life.

6.5 Implication for Comparables

One fundamental basic of property valuation is finding comparable data – not just when applying the comparison approach – and analyse this data to derive input figures which could be used within the valuation process. With the introduction of green features into property valuation which needs to be comparable things will become far more complex. The solution for example could of course be using Hedonic Pricing Models to a certain extent.

7. CONCLUSION

Premiums for green-buildings are likely and can already be observed in a number of markets and according to several case studies.

The accuracy of the valuation will depend upon the skills and market knowledge of the appraiser and his understanding of the fundamental context of green features and how they contribute to the overall market value. Therefore this paper can only support the understanding of basic fundamentals referring to green values (as for example stated in the Fig. 4 below) – the answer for a specific property in a specific market will differ a lot and it is the appraisers’ task to transparently reveal the market behaviour in the specific required submarket concerning certain features.

Green feature	Green impact	Theoretical linkage: added value to owner?	Evidence of market impact	Recommendation for adjustment
Energy efficiency				
Energy efficiency	Public benefits	<ul style="list-style-type: none"> •Only if tax savings / subventions etc. directly connected to the property 	If applicable easy to assess.	Adjustment of income (if clear regulation shows positive effect compared to Peers. BUT penalties for non-green might be more relevant in the future).
	Intangible benefits for tenants (Improved occupant productivity, lower churn, Increased turnover etc)	<ul style="list-style-type: none"> •Higher turnover rent if applicable. •Generally increased willingness to pay higher rent must be tested. •General lease agreements could be more favourable for owner. •Potentially lower vacancy and collection loss. •Potentially decreasing risk of economic obsolescence and therefore lower yield. •Longer economic life. •Higher marketability leads to faster lease up, lower vacancies and lower fluctuation. 	Rare market evidence and difficult to isolate.	Adjustment of income (only if market impact compared to Peers can be revealed). Reduce vacancy and collection loss slightly Reflect effect of potentially more favourable lease agreements accurate.
	Lower energy costs (for the tenant)	<ul style="list-style-type: none"> •Higher rent for new leases (but: bargaining and ending top-slice?) •Higher rent for "prestige"? •Lower yield for future proved property. 	Pure cost cutting effect will have an impact but regression etc. must be carried out. „Prestige“ probably just a first mover bonus that will disappear soon Yield impact crucial but hard to isolate. 10 to 20 BP were benchmarks in other markets.	Adjustment of income (not permanently and not the whole delta and only if leases are actually negotiable) (Adjustment in case of gross leases of course bigger!) Yield only if at least countrywide evidence can be stated.
	Maintenance costs	<ul style="list-style-type: none"> •Both way (higher and lower) might be the case depending on the technical level of the building 		Adjustment of maintenance costs in both ways is possible
Other green features				
Sustainable site development
Water efficiency				
...				

FIGURE 4: GREEN VALUE DRIVERS

Furthermore there are several issues which should be kept in mind when integrating the energy efficiency into property valuation:

- a) The effects due to the energy efficiency can be categorised into technical aspects which are directly related to the buildings’ components and more relevant market aspects which come up due to a shift of customers’ expectation.
- b) Due to the recent introduction of the energy certification, there is a lack of empirical data at the moment. Therefore so far the market effects are unclear and can not be priced in on the basis of empirical data.
- c) Pricing-in these effects on the basis of individual assumptions would impact the market in an endogenous way. As long as nobody knows how the market will react, appraisers should not act

proactively by pricing in assumed and therefore rather speculative developments. They are obligated to analyse market change accurately and try to follow it continuously until empirical data is available.

d) When considering energy efficiency, there is the threat to mix up causes and effects. Appraisers must be aware of the fact that one cause can imply a number of effects - but never should be priced in twice.

e) We will never be able to derive global benchmarks to price in energy efficiency classes. Different utilizations, locations, market situations require different types of calculations. This aspect stresses the need to follow the reaction of the local market.

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