

# ARE “GREEN FACTORS” ABLE TO DRIVE THE REAL ESTATE VALUE UP?

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## Abstract

Purpose: This study is an attempt to analyze and characterize the most popular real estate appraisal methods in Poland. The most important factor for the green building market development in Poland is the value of the house which reflects environmental costs and benefits. However the real estate appraisal is mainly focused on non environmental issues. Design/methodology/approach: All of the valuation approaches are closely analyzed to point the level of consideration of environmental friendly aspects of the property. The research studies the literature of real estate valuation methodology, statistical and real estate data published by real estate agencies. Some inside information gathered from real estate agencies and property valuers was also taken into account. Findings: The result of the study indicates that real estate appraisals do not take into consideration the environmental friendly issues implemented in the building. A few factors, such as good insulation or green location, are the ones that can increase the value of the house the most. The research shows the need for improving the real estate valuation methodology in Poland. Originality/value: This study is the first one in the field to point the new directions of development towards green buildings in Poland.

**Key words**: appraisal methodology, green buildings, green features, valuation, sustainable market

## Introduction

In the era of ecology awareness sustainable development in all sectors of economy plays a key role. It means that making our buildings more energy efficient is really crucial for climate change. Starting from the 70's there has been a vivid international debate about the ability of economy to fulfill the needs of present and future generations. Therefore the idea of sustainable development was born. The most common definition of sustainable development was presented in Brundtland Report. In that report “*Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs. It contains within it two key concepts:*

- *the concept of needs, in particular the essential needs of the world's poor, to which overriding priority should be given; and*
- *the idea of limitations imposed by the state of technology and social organization on the environment's ability to meet present and future needs."* (World Commission on Environment and Development (WCED), 1987)

The real estate sector in Poland is aware of above-mentioned concepts and realizes the need to reduce its environmental impact. Nevertheless, the green building market in Poland suffers from a lack of proper interest. The most important factor for development of the market in Poland is proper valuation process of green properties. However, the real estate appraisal is mainly focused on non environmental issues. It seems that despite widely propagated financial and environmental benefits for green buildings, real estate prices are not influenced by their sustainable characteristics.

## **1 Methodology**

The paper is an attempt to characterize the most popular real estate valuation methods in Poland. All of them are analyzed to point the level of consideration of environmental friendly issues of the building. The research seeks to achieve it by studying literature of real estate valuation methodology and green building movement (both national and worldwide). By analyzing worldwide literature some assumptions about perspectives on future trends were established. Information gathered from real estate agencies and real estate appraisers was also taken into account. The paper is the result of the first part of the research on green factors of buildings and their influence on a property's value.

## **2 Green building in Poland**

Recently in Poland there are aspirations for shaping eco-friendly requirements concerning buildings. It appears by striving to minimize energy usage and emission of pollutants. It also includes a decrease of environmental nuisance of the building in both internal and external environment (Górzyński, 2007, pp.214-15). Sustainable building (green building) is the kind of the construction which in the whole life cycle (LC) takes into consideration environmental, social and economic aspects. Environmental aspects are strictly related to construction, operation and utilization of the building. They are correlated inter alia with the green house potential level, value of pollutants' emission, prime energy demand, generating of waste, water demand, microclimate, and ozone layer destruction potential.

Social aspects of LC of the building include all features that can influence the quality of life of societies. Those consist of quality of inner air (humidity, etc), natural lighting, acoustic and heat comfort. After all, the most important aspect of the building for investors is the economic one. Here we can highlight the costs of the building in its life cycle, the income it generates (for example from rent) and fluctuations of real estate value during the life cycle.

The green building market suffers from a lack of proper interest. The most important factors hampering sustainable building market development are equivocal terminology, lack of ecological awareness and value of the house which does not reflect environmental costs and benefits.

**2.1 Polish green building’s terminology**

Terminology of buildings that are environmental friendly is not standardized. Different names used to describe these properties are disseminated among societies and researchers. “Sustainable”, “green”, “ecological”, “energy efficient” are the most common terms to describe them. Lower environmental impact of green building is reached by higher energy efficiency, usage of renewal energy sources and modern design strategies. Besides aspects that are directly attached to environment protection, also other aspects such as social and cultural aspects, health issues and life cycle costs are taken into consideration. In Fig. 1 the most popular in Poland terms (according to the author) can be found. In the classification the buildings that are mostly focused on energy saving are called energy efficient, low emission and passive buildings. The author concentrates on properties that not only reduce energy consumption but also have other eco- features. Nowadays passive house and ecological house are very popular in Poland. Passive house is special kind of energy efficient building, energy demand of these properties is around 10-15 kWh/m<sup>2</sup>\*year. This kind of the building is distinguished by compact construction, good thermal insulation and passive use of solar energy (Wnuk, 2006).

	terminology/ concept	Energy efficient building	Low emission building	Passive house	Green building	Sustainable building	Ecological building
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Aspect	functionality					+	
	energy efficiency	+	+	+	+	+	+
	amount of resources	+	+	+	+	+	+
	comparability of environmental issues	+	+	+	+	+	+
	health	+	+	+	+	+	+
	social and cultural aspect				+	+	+
	Life Cycle costs				+	+	

Fig. 1 Partition of terms describing environment friendly buildings with consideration of ecological characteristics (source: self elaboration based on (Nelson & Rakau, 2010))

Confirmation of fulfillment of those conditions is Passivehaus Institut's certification. First Polish passive house is located in Smolec near Wroclaw. Construction of ecological buildings (low-tech buildings) is based on low processed and natural (organic) materials. What is very important, is that those properties are adopting old, traditional construction methods to our times. "Green building" term relates to more advanced and sustainable properties. Green buildings are efficient in their use of energy, water and other resource, and are designed to create better environment for occupants. They function in consideration of the sustainable development's idea. The author perceives the difference between the terms "green" and "sustainable" building (as shown in Fig. 1), however, for the purpose of the paper those terms will be used interchangeably.

## **2.2 Law and regulations**

Polish construction sector needs more sustainable approach in order to decrease energy consumption. Policy of EU<sup>1</sup> aims not only to lower energy demand of the buildings but also lower usage of natural resources during their life cycle. In Poland implementation of the European laws concerning buildings is made by amendment of existing laws and regulations. Directive 2002/91/EC of the European Parliament and of the Council of 16 December 2002 on the energy performance of buildings was transposed via act- Construction Law and ordinance of Ministry of Infrastructure of 12 April 2002 on technical requirements which should be met by buildings and their location. In 2008 changes were made in Technical Requirements<sup>2</sup> in accordance to Directive 2002/91/EC. As indicated in the act buildings and their installations have to be designed and accomplished to minimize energy demand. Since year 2009 due to new regulations (Construction Law) all new buildings (the ones on real estate market, refurbished or renovated) have been obliged to have a Energy Performance Certificates (EPC). In 2010 European Parliament approved new Directive on energy performance of buildings- Directive 2010/31/EC of the European parliament and of the council of 19 May 2010 on the energy performance of buildings. According to this regulation all new buildings in the EU by the year 2020 need to be nearly zero-energy ones. However, the term „nearly zero- energy buildings” is not precisely defined and gives the member countries the opportunity to establish its own referral merit in this matter. By the end of June 2012 Directive 2010/31/EC should be transposed to Polish law.

### **2.2.1 Certification systems available in Poland**

The lack of homogeneous definition of green building made it hard to establish one terminology respected in all fields for those buildings. To warrant environmental friendly aspects of the building same certification options were introduced. In Poland there is one mandatory certification system, which results in having Energy Performance Certificate (EPC). In EU<sup>3</sup> all new buildings, and sold or rented ones are obliged to have a energy performance certificate. An example of this certificate can be found in Fig. 2. EPC uses comparative scale and quantifies energy consumption level. This allows to determine

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<sup>1</sup> EU- European Union

<sup>2</sup> Rozporządzenie Ministra Infrastruktury z dnia 12 kwietnia 2002 r. w sprawie warunków technicznych, jakim powinny odpowiadać budynki i ich usytuowanie (Dz. U. Nr 75 z późniejszymi zmianami)

property's energy efficiency level. However the EPC does not warranty sustainable approach of the building. A property with this certificate not always is energy efficient, the result of the calculation of energy consumption can however indicate level of energy efficiency.

**ŚWIADECTWO CHARAKTERYSTYKI ENERGETYCZNEJ**  
 Dla budynku mieszkalnego nr: \_\_\_\_\_ 1

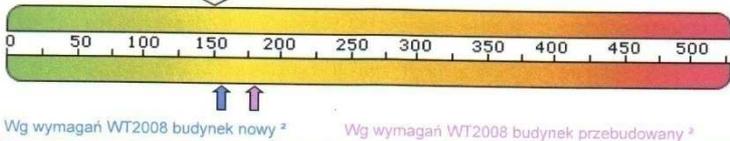
**Ważne do: 30 marca 2020**

Budynek oceniany: Budynek mieszkalny

Rodzaj budynku	Budynek mieszkalny jednorodzinny	
Adres budynku		
Całość/Część budynku	całość	
Rok zakończenia budowy/rok oddania do użytkowania	2009	
Rok budowy instalacji	2009	
Liczba lokali mieszkalnych		
Powierzchnia użytkowa (A <sub>u</sub> , m <sup>2</sup> )	176,45	
Cel wykonania świadectwa	<input checked="" type="checkbox"/> budynek nowy <input type="checkbox"/> rozbudowa <input type="checkbox"/> budynek istniejący <input type="checkbox"/> ogłoszenie <input type="checkbox"/> najem/sprzedaż <input type="checkbox"/> inny	

**Obliczeniowe zapotrzebowanie na nieodnawialną energię pierwotną <sup>1</sup>**

EP - budynek oceniany  
151,83 kWh/(m<sup>2</sup>rok)



Wg wymagań WT2008 budynek nowy <sup>2</sup>      Wg wymagań WT2008 budynek przebudowany <sup>2</sup>

**Stwierdzenie dotrzymania wymagań wg WT2008 <sup>2</sup>**

Zapotrzebowanie na energię pierwotną (EP)		Zapotrzebowanie na energię końcową (EK)	
Budynek oceniany	151,83 kWh/(m <sup>2</sup> rok)	Budynek oceniany	134,86 kWh/(m <sup>2</sup> rok)
Budynek wg WT2008	158,55 kWh/(m <sup>2</sup> rok)		

1) Charakterystyka energetyczna budynku określana jest na podstawie porównania jednostkowej ilości nieodnawialnej energii pierwotnej EP niezbędnej do zaspokojenia potrzeb energetycznych budynku w zakresie ogrzewania, chłodzenia, wentylacji i ciepłej wody użytkowej (efektywność całkowita) z odpowiednią wartością referencyjną.  
 2) Rozporządzenie Ministra Infrastruktury z dnia 12 kwietnia 2002 r. w sprawie warunków technicznych, jakim powinny odpowiadać budynki i ich usytuowanie (Dz.U. Nr 75, poz. 690, z późn. zm.), spełnienie warunków jest wymagane tylko dla budynku nowego lub przebudowanego.  
 Uwaga: charakterystyka energetyczna określana jest dla warunków klimatycznych odniesienia - stacja Wrocław oraz dla normalnych warunków eksploatacji budynku podanych na str. 2.

**Sporządzający świadectwo:**  
 Imię i nazwisko: **MARGORZATA SŁIČNA**  
 Nr uprawnień: **MI/SE/1601/2009**  
 Data wystawienia: 2010-03-30

2010-03-30  
 Data      Pieczęćka i podpis

Fig. 2 First page of Polish energy performance certificate (source: self elaboration based on Rozporządzenia w sprawie metodologii sporządzania świadectw charakterystyki energetycznej)

Besides mandatory certification the Polish real estate market is open for voluntary certification systems of green buildings. Worldwide known certification systems (available in Poland) of sustainable buildings are as follows:

- LEED (Leadership in Energy and Environmental Design)- origin USA,
- BREEAM (Building Research Establishment Environmental Assessment Method)- origin UK,
- DGNB (Deutsche Gesellschaft für Nachhaltiges Bauen e.V.)- origin Germany,
- EU GreenBuilding, origin European Union,

LEED is the most popular certification system in the world. Any kind of the building can register for LEED certification. However receiving the certificate is a long lasting process as the system assesses the building in life cycle period. In Poland in year 2012 there are 39 registered properties for LEED. As of year 2012 there has been 6 buildings holding LEED certificate (3 properties with Silver LEED and 3 with Gold LEED) (Jackowska, n.d.). BREEAM was established in year 1990 and was the first certification system in the World,. Thanks to that a lot of subsequent systems model themselves on it. At present 5 Polish buildings have received BREEAM certification (Jackowska, 2012) (Juchimiuk, 2011). Even though German real estate market is the biggest in Europe their certification system was established recently (Nelson & Rakau, 2010). DGNB is one of the most complex certification systems in the world as it complies both environmental, economic and social aspects. This system has just been introduced to Polish construction and the real estate market in April 2012. GreenBuilding program differs from LEED, BREAM and is focused just on energy efficiency. Properties with really high level of energy savings can receive this certificate. In Lower Silesia region (Poland) this certificate is owned by (for example) Grunwaldzki Center (commercial building in Wroclaw). There is no green building certification system origin in Poland therefore sustainable buildings located in our country are registered in systems mentioned above. However the number of Polish properties holding the green building certificate is low in comparison with other European countries.

### **3 Real estate appraisal in Poland**

Real estate appraisal's main goal is to determinate value of the building. The term – “real estate value” is ambiguous and can allow various interpretations. In theory there are 3 elementary trends in real estate valuation:

- absolutistic,
- relativistic,
- assorted (mixed).

Absolutistic approach to valuation is based on the idea that income ability of the real estate is the only right factor on which to base the appraisal. Relativistic method, on the other hand, states that every property has many different values depending on the goal of appraisal. Diverse valuation methods are allowed in assorted approach, however, more and more entities consider market price for the only correct appraisal method. It's possible on the assumption that the competitiveness condition exists and the market value can be determined in practice (Mączyńska et al., 2004, pp.39-52). In the paper the market value is the only one being analyzed. In European Valuation Standards market value is defined as “the estimated amount for which the property should exchange on the date of valuation between a willing buyer and a willing seller in an arm’s length transaction after proper marketing where in the parties had each acted knowledgeably, prudently and without compulsion.” (The European Group of Valuers' Association, 2007)

### **3.1 Most common valuation methods**

Since real estate valuation methodology is complicated it's regulated by law. Polish law in the subject includes acts and ordinance, such as:

- Act of 21.08.1997 on the real estate economy (*Ustawa o gospodarce nieruchomościami* Dz.U. 1997 Nr 115 poz. 741 z późn. zm.)
- Council of Ministers ordinance of 21.09.2004 on the real estate valuation and drawing up valuation report (Rozporządzenie Rady Ministrów z dnia 21.09.2004 r. w sprawie wyceny nieruchomości i sporządzania operatu szacunkowego (Dz.U. 2004 nr 207 poz. 2109

Since year 2004 valuers' occupational standards has been binding regulation (Anon., 2012). For Polish property experts National Valuation Standards and so called “interpretative notes” are in force rules in the real estate valuation. Due to constant improvement process of those standards „interpretative notes” present good practice guides, which were agreed on with Polish Federation of Valuers' Associations (PFVA).

Methodology of the real estate valuation singles out approaches. They consist of methods which contain appraisal techniques (See Fig. 3). To determine real estate market value appraisers use comparative, income, cost and mixed approaches. The one to be employed depends on the goal of valuation, the type of property, the market data availability, clients preferences and etc. The most common approaches are comparative and income. However, in specific conditions mixed approach is used. Specific conditions are the ones

when valuer is not able to use sale comparison or income approach. When buyer is interested in replacement (reconstruction) cost of the property the cost approached is used (Brzeski et al., 2008, pp.893-93).

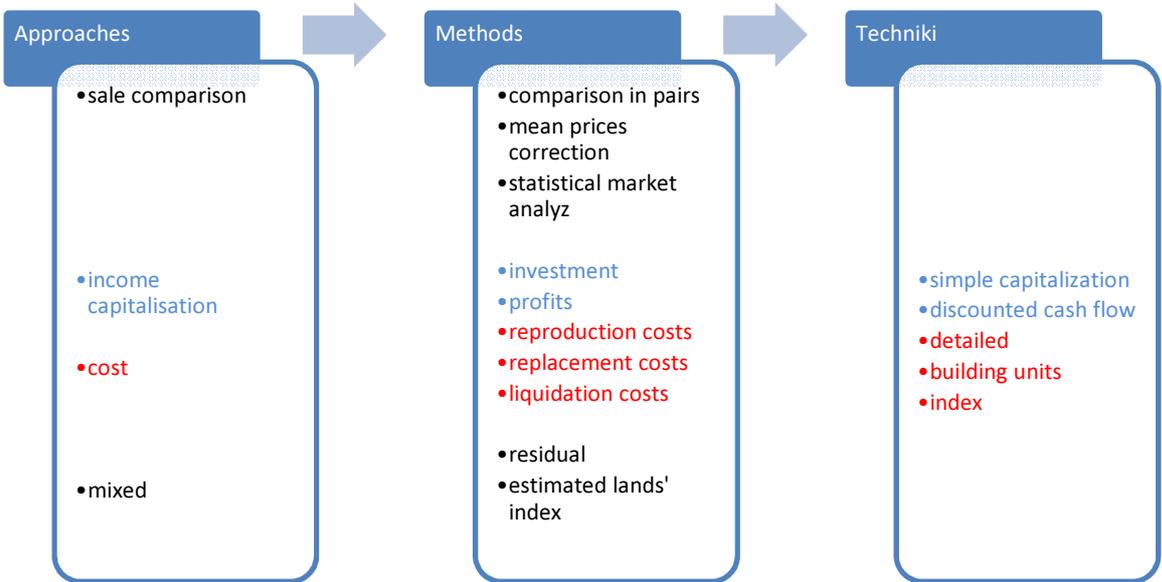


Fig. 3 Approaches, methods and techniques applied in real estate valuation in Poland (source: self elaboration based on (Mączyńska et al., 2004))

The proper valuation requires the knowledge about the depreciation, replacement or reconstruction costs of existing property (Brzeski et al., 2008, pp.893-94). This approach is based on estimates of the cost to construct another property that is either replica of original or of equivalent grade. The most common approaches and techniques used in Poland to value properties are sales comparison and income approach. Further details on each of these valuation techniques are provided below.

Sales comparison approach is based on the rule that buyer relies on prices paid for similar properties in the same neighbourhood at the same time. It is used when valuer has an access to market date regarding similar buildings. Those properties need to have characterized features which distinguish them by. Real estate value needs to be corrected by those features including influence of the time on prices. In this approach 3 methods (comparison in pairs, mean prices correction, statistical market analyze) are used. This methodology is seldom applied to rare or special-purpose properties due to lack of buildings to compare to.

In income approach buyer values the property by profit rate of similar buildings in the same location. The annual income is calculated by summing the gross potential income that building can generate. It can be used when prices and economics are well known. Value is determined by the capitalization of net annual income of the property. There are two techniques used: simple capitalization and discounted cash flow. Simple capitalization is based on capitalization of net annual income using market derived capitalization rate, which is obtained from analysis of similar property transactions. The rate is adjusted to appropriately reflect variations in risk. Discounted cash flow technique provides an assessment of value by discounting the future revenues and expenses generated by the property over the holding period. This involves numerous factors and assumptions regarding timing and duration of cash inflow and outflow. The accuracy of the valuation remains subject to the valuer's knowledge and relevant expertise.

### **3.2 Factors affecting property's value**

The nature of market in which the real estate market value is determined differs according to the subject of the trade. Market conditions will vary with the changing balance of supply and demand, changing knowledge, fashion, laws and regulations, expectations, credit conditions, hopes of profit and etc. The question every valuer needs to ask is whether sustainability matters to the market, and thus, to what degree green features should (or should not) be valued. No matter which valuation approach is used, appraiser first need to understand whether market values green features (Runde & Thoyre, 2010). Unfortunately, recent studies have shown that the Polish market is valuing just a few green features of a property. In (Runde & Thoyre, 2010) there are suggestions that appraiser before valuing the building should categorize the property (green or non- green category) and the market. Market can be either sustainable oriented (SO) or not sustainable oriented (NSO). NSO market is described by (Runde & Thoyre, 2010):

- few or no regulation,
- green-up limited to compliance,
- few or no green buildings,
- no local GBC (Green Building Council) chapter,
- limited or no evidence of sustainable uptake in community.

Those factors are true for US market, however they can apply to other locations as well. According to featured information the Polish green building market meets most of these

characteristics. We have few regulations in the field, green-up is limited to compliance. Most of the investors in the market do as little as possible to fulfill national requirements. There are just a few green buildings and sustainable uptake in community is limited. Polish Green Building Council (PIGBC) was established in 2006, however the awareness among investors and consumers on sustainable buildings is still low.

The market orientation needs to be considered while adjusting the green features of the properties. Helpful in that matter can be information in Fig. 4

SUBJECT	MARKET	Adjustments to Comps (Sale and Rent)		Potential Impacts on Subject in the:	
		Brown Comps	Green Comps	Income Approach	Cost Approach
BROWN	NSO		Analyze any specific green features of comps & adjust as needed		
GREEN	NSO	Adjust ↑ for green features that brown market values	Compare green features of comp to subject	Analyze green features for + or (-) economic impact	Market may not recognize all extra costs on \$ for \$ basis – assess green feature costs individually
BROWN	SO		Adjust ↓ for any superior green features of comp	↓ rent and/or growth rate? ↑ vacancy? ↑ absorption? ↑ energy and/or water cost? ↑ Cap Ex reserves ↑ OAR ↑ Discount rate? Cap Ex to green up	Replacement cost will likely reflect green construction so depreciation should reflect brownness of subject
GREEN	SO	Adjust ↑ for green feature deficiency	Compare specific green features of comp to subject	Assess if subject meets/exceeds the "greenness" of the market	

Fig. 4 Sustainability Valuation Impact Grid (Runde & Thoyre, 2010)

In case green property is located in NSO the appraisal should analyze green features (adjust subject as necessary) and review comparables to be sure they are or are not green adjusting if necessary. Valuer should also consider risks associated with resource use, obsolescence, transparency and stakeholder influence, externalities. Real estate valuation in Poland is mainly focused on non environmental issues. It may be cause by lack of ecological awareness, thus unavailability to value externalities. In some countries (Australia) seminars and courses are offered to introduce green building idea to appraiser. PIGBC is promoting the

sustainable design idea by hosting conferences, fairs, etc. Lately post graduate studies are offered in architecture and sustainable building (PIGBC, n.d.). Seminars are offered to improve knowledge about green buildings and their valuation. Courses on green building valuation are not offered in Poland yet. They are available in US and show familiar appraisal principle and procedures with a new context. The seminars address how green buildings are analyzed and valued for investment purposes. In these seminars appraisers can for example get information how to:

- Identify the relevant components of a green building,
- Discover green properties resources,
- Analyze the relevance of green features in the market (Pitts & Jackson, 2008).

### **1.3.1 Economic and environmental potential of green buildings**

Result of Green Building Council research have shown that green buildings (Arnel, n.d.):

- consume 85% less energy,
- consume 60% less water,
- generate 69% less waste.

A study published in Green Building Market Barometer shows that executives (from US construction sector) believe that green properties have lower energy costs, lower overall operating costs, lower total lifecycle costs over a 10-year span (in accordance 84%, 68%, 59% of respondents) (Turner Construction Company, 2008). Moreover, executives reported that green buildings have better financial performance than non-green buildings in following areas:

- building values,
- asking rents,
- return on investments.

Sustainable buildings are proving to be less risky, more stable in value, easier to rent and sell (Lützkendorf, 2011). Financial advantage of green buildings (in some cases) is hard to be empirically verifiable. In Fig. 5 economic advantages are analyzed from a point of view of the respective stakeholder and are described qualitatively. The most economical (according to classification above) is energy efficiency, reduction of water consumption,



conditions. Due to high prices of some environmental friendly features the results were oscillating between 12-45 years.

#### **4 Environment protection issues in valuation process**

The purpose of a valuation is to forecast the future benefits of a property and calculate this into a current price. The accuracy of that appraisal will depend on the skills and ability of valuer in understanding the factors that influence value.

The sale comparison approach is appropriate for valuating green buildings. However valuer can encounter difficulties to find similar properties for comparison. This situation is a common one in Poland. Even if similar green buildings can be found for comparison appraiser still needs to make adjustments as green buildings may vary. Properties with the same green certificate can be assumed to be alike. Nonetheless appraiser needs to check green features and compare the level of certification (LEED has 3 levels which represent different approaches to environmental issues). Passive buildings may be consider similar as far as environmental impact level is concerned and can make it easier to value their features. Unfortunately in Poland there are 3 buildings with PassiveHaus Certificate (Anon., 2012). EPC can help in valuing green features, however appraiser can seldom find older properties with this certificate.

The cost approach may also be consider for determining value of green buildings. After estimating the reproduction and replacement cost of sustainable property, valuer can determine depreciation. Green buildings are built with more durable materials which results in their longer economic lives. Some forms of accrued depreciation of those buildings may be lower than for conventional ones (Pitts & Jackson, 2008). In some markets buyers may not be willing to pay a full cost for green amenities that already exist in the building and in that situation some adjustments should be made. The cost approach may ignore benefits of green characteristics and the effects they have on asset value. This flaw states for not using a cost approach. In Polish market it seems possible for some investors to decline paying extra for green features already installed in the property. Those features hardly are recognized as assets and thus may be omitted during appraisal process.

The income approach can also be consider for valuing green buildings (commercial buildings). Green attributes may reduce operating costs such as energy cost, water cost, maintenance and repairs. Those costs reductions increase net operation income. It is said that

green properties rent faster and at higher rents (Arnel, n.d.). Green Building Council Australia pointed other factors such as: longer lease terms, higher growth potential (compare to traditional buildings), reduction of vacancy rates (Bowman & Wills, 2008). However there is no market data on the subject available in Poland. Therefore, when applying income approach valuers will need to make their own judgment about the size of future benefits in those areas until detail market data is available. Discounted cash flow (DCF) technique is a good tool useful for valuing both green and non-green properties. Appraising green buildings using DCF allows numerous inputs that can be adjusted for sustainable building features.

Some believe that green buildings can be considered semi-specialized class due to the fact that they are different enough from conventional ones. In situation of a small number of green buildings applying methods, which are usually used for specialty properties, may seem appropriate (Pitts & Jackson, 2008). This can be useful in Polish conditions as the amount of green buildings is very limited.

#### **4.1 Present situation in the real estate valuation**

Appraisers need hard data confirming increase in value of green buildings in order to include the green factors in their valuation. Major, worldwide problem in gathering the data is that many green buildings are public-sector properties and are not built for investment purposes (Pitts & Jackson, 2008). In Poland the problem is the small amount or even lack (in some parts of the country) of green properties. However, most of green buildings are private-sector and owners/ investors are not keen on sharing financial data about those properties. Situation ought to be different when those change hands. Furthermore some green features of the building are benefiting occupier rather than owner or investor. This situation also causes difficulties in valuation of sustainable properties. Implementation of Energy Performance Certificates in Poland was supposed to distinguish green properties in the real estate market. The certificate can be a good tool to characterize green features of the building, and thus help appraiser to include them in valuation process. EPC is a source of information about energy consumption, energy source used, quality of systems installed, etc. Properties with this certificate should be easy to value, as green features are visible at first glance. Even though according to Polish law all properties on the market are obliged to have EPC, most of owners bypass the law. It is a common practice for real estate agencies and notaries to construct the agreement between buyer and seller with a paragraph stating that buyer is aware of the fact that property doesn't have a EPC. Buyer chooses to purchase that property by lower price and

seller can save on costs by not paying for EPC. This situation hampers the development of green building market and its valuation improvements.

Research conducted in year 2010 by Schöck Polska highlights that 80% of Poles presume good insulation systems (hence energy efficiency) as a very important factor of property. Other result indicate that 63% of respondents take into consideration insulating technologies and materials used while buying a house (Anon., 2010). Discourse with real estate agencies from Wroclaw city revealed that the price of property influences the demand the most. It can suggest that higher prices of green buildings (compared to traditional buildings) may reduce demand and hamper the development of green market. Information gathered from real estate agencies suggests that factors taken into consideration while buying the properties are as follows:

- location,
- property's area,
- good neighbourhood,
- property's standard.

This influences the approach to valuation of buildings. Main factors able to increase the value of property are the ones mentioned above. The author had a possibility to research historical transaction records from real estate agencies and none of them said anything about green features. It seems that despite widely propagated financial and environmental benefits for green buildings, real estate prices are not influenced by their sustainable characteristics.

## **4.2 Conclusions**

In the era of ecology awareness sustainable development is a main issue in global economy. According to European Commission buildings are responsible for 40% of total energy consumption in EU (Directive 2002/91/EC of the European Parliament and of the Council of 16 December 2002 on the energy performance of buildings). The most important factors for the sustainable building market development in Poland are unequivocal terminology, ecological awareness and value of the house which does reflect environmental costs and benefits. The result of the study indicates that real estate valuation does not take into consideration the environmental friendly issues implemented in the building. A few factors, such as good insulation or green location, are the ones that can increase the value of the house the most. Valuation not considering green features seems to be caused by small amount of green buildings and as a result lack of information about their benefits. This paper is the result

of the first part of the research on green factors of the building and their influence on increasing the value of real estate. The research shows the need of exploring the problem in more detail. The author is planning to conduct a survey among developers/ investors, real estate agencies, valuers, consumers. The survey is supposed to gather profound information about the Polish green real estate market's problems such as lack of proper green building valuation methodology. Values of "willingness to pay" and "willingness to accept" may be revealed in the field of green features, which can help to propose modifications to the appraisal process in order to include environment friendly aspects of the building.

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