

# MARKET VALUE OF SUSTAINABILITY BUILDINGS AND THEIR MARKET SHARE

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## Summary

In recent years, two main trends could be observed in the realty market and in the construction sector – there are holistic look at the buildings over their life cycle and implementation of the principles of sustainable development. Users of constructions already begin to consider contributions and risks associated with ownership and using sustainable buildings. It is necessary to break the vicious circle of blame, in which the property market players disarrange liability for it, that they do not build sustainable buildings, one on second. Then share of sustainable buildings on the realty market could increase. How estimate the market value of sustainability building? It is necessary to combine knowledge and experience from economic field with technical experiences and knowledge of social issues and relation to environment. Sustainable buildings are mostly more resistant to obsolescence. Their service is cheaper, they offer higher quality of life and they might increase the owner image. The sustainable buildings have higher potential of growth. It can reflect in their higher market value in comparison with conformal buildings.

**Keywords:** sustainable, market value, appraisal, energy demand

## 1 Sustainable building

### 1.1 Definition of sustainable building

How to define the concept of sustainable real estate, respectively sustainable construction? It can be found large number of definitions of sustainable development or sustainability in literature and Internet. The most frequently cited definition is that used in the Report of the World Commission on Environment and Development. The Commission defined sustainable development as a development that meets the needs of the present without compromising the ability of future generations to meet their own needs. Sustainable development lies in the balance of economic and social development, provided protection of the environment. Sustainable development and sustainable construction are characterized by three pillars, which are the quality of the environment (both, internal and external), economic efficiency and economic constraints, and social and cultural context.

The main objectives of sustainable design are to avoid resource depletion of energy, water, and raw materials, prevent environmental degradation caused by facilities and infrastructure throughout their life cycle, and create built environments that are liveable, comfortable, safe, and productive. Fundamental principles are:

- optimize site/existing structure potential,

- optimize energy use (reduce load, increase efficiency, and utilize renewable energy resources),
- protect and conserve water (reduce, control, and/or treat site runoff, use water efficiently, and reuse or recycle water for on-site use, when feasible),
- use environmentally preferable products (materials that minimize life-cycle environmental impacts such as global warming, resource depletion, and human toxicity),
- enhance indoor environmental quality (day lighting, ventilation, moisture control),
- optimize operational and maintenance practices (reduce life-cycle cost).

## 1.2 Value added of sustainable building

Comparing the requirements for the construction of the current laws and requirements for sustainable building, we could see a value-added, respectively higher standard of the sustainable buildings. The lower energy demand not only in use (usually a low energy or passive houses), but also during their construction (materials with lower primary energy consumption are used) flows from more strict requirements for sustainable building compared with conformal buildings. Sustainable buildings are more environmentally friendly, there are made from recycled and recyclable materials, in course of production of these materials lower production of CO<sub>2</sub> is achieved. Some of these materials are able to absorb the CO<sub>2</sub> produced by the use of buildings (wood-based structural elements). Philosophy of a healthy environment within the building determines the use of such materials which are potentially not harmful (e.g., elimination of materials containing formaldehyde). Environmentally preferable materials have a reduced effect on human health and the environment and contribute to improved worker safety and health, reduced liabilities, reduced disposal costs, and achievement of environmental goals. The indoor environmental quality of a building has a significant impact on occupant health, comfort, and productivity. Among other attributes, a sustainable building maximizes day lighting, has appropriate ventilation and moisture control. Additionally, consider ventilation and filtration to mitigate chemical, biological, and radiological attack. The emphasis placed on economic efficiency for sustainable buildings leads to lower life cycle costs, which is achieved by improving the maintainability, adaptability, durability and, of course, a lower demand for energy consumption or use of alternative energy sources. The following text discusses the possibility of including added value of sustainable buildings in appraisal of their market value.

## 2 Appraisal

It is well known that the value of property is affected by the situation in the relevant market segment, the supply and the demand for a type of realty, stability or, vice versa, market volatility, the competitive environment, expectations and anticipated changes, trends, types and size of risk, economic, social, demographic and physical effects. All relevant factors should be analyzed and evaluated with regard to the purpose of appraisal.

To determine the market value of the property these basic methods are typically used:

- Comparative method,
- Cost method,
- Income method.

Essentially, only comparative and income method can be used to include added value of sustainable buildings in appraisal of their market value.

## 2.1 Comparative method

It is clear that the comparison method can be used for the market value indication in the case we have information on sales prices and parameters of comparable properties. The expert usually faces two problems:

- Difficulty to find comparable sustainability properties (with characteristics of sustainable design) and
- Difficulty to identify and measure the sustainability physical characteristics and attributes of valued property as compared with comparable properties.

Comparison can be based on the descriptions of buildings, building documentation, power plant certificates, and if not available, on expert's own assessment, which should result from knowledge of the sustainable development principles.

## 2.2 Income method

The market rent (for the determination of the potential gross income), the operating costs (for the determination of the net operating income), and the capitalization or discount rate are major inputs in using the income method. Sustainable design features of the property may affect all three input parameters.

Sustainable design structures can significantly reduce the operating costs and this leads to higher net operating revenues. The items of expenditure settled by the property user (or tenant) are mostly affected by sustainable design (cost of heating, cooling, lighting, water usage, etc.). These items, however, the calculation of net operating income does not include. However, the implementation of sustainable design can result in reduced costs of maintenance, renewal, and the building administration. These items are paid by the owner of the property and are included in the calculation of the net operating income of the property.

Sustainable design of structures affects the achievable rents from the valued property. For an expert may be difficult to justify higher rents for sustainable properties, it is almost impossible to find a comparable property.

The most important input factor, by which we can consider the sustainable character of building, is capitalization or discount rate. Both rents should reflect the risks associated with the valued property. The basis for determining these rates is analysis of comparable properties, as well as knowledge of relevant market factors and economic indicators. The future development is estimated by the determining of the rate. It is the process of setting interest rates, which enables to conclude all the advantages and benefits of sustainable building in appraisal of the property. For example, lower operating costs and increased user comfort usually leads to increased attractiveness of the property. It results to the lower vacancy, to the lower risk of tenants lose, and thus to more stable cash flow. The use of environment-friendly materials can lead to lower risk of legal processes and penalties. The problem is that not all experts are able to provide the correct rate that could correctly reflect the superiority of the sustainability properties.

### 3 The market share of the sustainability properties

The number of properties, which can be described as sustainable, steadily increases. Major projects are highly publicized, promoted and of course traded. As examples of sustainable construction in the CR may be appointed Czech National Technical Library, Koberovy passive house, CSOB bank Radlice, Nordica Ostrava, and others. Low energy family houses are offered on market too, for example a total of 8870 houses, of which 4529 with usable area of 100 to 200 m<sup>2</sup>, including 145 low-energy houses are offered in Central Region of CR (the date of March 1, 2010). The analysis of sale prices of family houses in Prague East District was performed. The results are - the average price per 1m<sup>2</sup> of useful floor area of conformal houses is 38,870 CZK, while the average price per 1m<sup>2</sup> area of low-energy houses is 40,456 CZK. There were analyzed the family houses of usable area from 100 to 200 m<sup>2</sup>, land size of 400 to 900 m<sup>2</sup>, the maximum age of 5 years.

**Tab. 1 Market with family houses Central Region of Czech Republic**

	Family Houses		Family Houses (usable area 100-200 m <sup>2</sup> )		Low-energy Houses	
Central Region of CR	8,870	100 %	4,529	51,06 %	145	1,63 %
Prague East	1,929	100 %	1,117	57,91 %	77	3,99 %

### 4 Conclusions

The sustainable properties have a higher standard; their added-value in comparison with conformal buildings can be observed. Therefore they have higher market value. The possibility of including added value in appraisal of their market value using Comparative method and Income method was discussed. The sustainability buildings market share is still small, which is illustrated in Tab.1. The market value reflects the sustainable parameters of property; this fact is illustrated with the higher average price of low-energy houses.

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*This research has been supported by the Ministry of Education, Youth and Sports of ČR, grant No. MSM 6840770006 („Management of sustainable development of the life cycle of buildings, building enterprises and territories“).*