

Exploring the correlation between sale price and rent with the degree of Itaca Protocol endorsement

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Abstract

Many publications are dealing with the energy efficiency as it reflects on the price of users, yet without much diffusion among those really interested.

Some of the papers published are reviewed providing the general idea about the research activities and the common denominator which is the need of measuring the benefits.

Some property and real estate brokers have been interviewed in Serres, Thessaloniki and Chalkidiki, displaying the different approaches depending on the geographic conditions, as even the literature sustains.

There is a need of quantitative basis for calculating the benefits of improvement of energy efficiency, which may be the volunteering assessment according the ITACA protocol.

1 Introduction

The question about the worth of the additional costs required by the energy efficiency improvement of the buildings, be them private houses or of public usage (like schools, City Halls, even Prisons) is connected with the economic considerations, such as:

- When will the investment be “paid back”
- What is the annual saving for “energy bills”
- What is the life span of the investments

In order to be able to make similar calculations we usually start with assumptions about:

- The mortgage interest rate (it depends on the global economic equilibrium).
- Inflation forecasts (it is questionable whether are the forecasts boosting {or decelerating} the inflation rate – if the forecasts are published.
- Real estate brokers act and react “in a rational” way.
- The climatic change, affecting the needs for energy.
- The energy prices (crude oil, natural gas, electricity).
- Taxes on renewable energy sources when used as private energy sources.

This has to be compared with:

- The incentives to implement energy efficiency to newly constructed or retrofit buildings.
- The possible marketability of buildings, for ownership transfer or rent, reflecting the energy efficiency.

The degree of uncertainty is increased by the public opinion about the use of polymer insulation material, that are thought to emit harmful gases as they degenerate over time, or the fear for radon nuclear radiation, if stone based insulation is used and other “hoaxes” that affect both sides of the market, demand and supply.

Researchers have based their work on questionnaires, addressed to the general public and most of the researches have been conducted in so different environments as Florida in USA or Switzerland, with different needs and far above the average of the

available pro capita revenue and a cost of energy (both fossil and electricity) far below average of EU countries, because of very low taxation.

Potential buyers or tenants have still very little awareness of the cost of living in a building as a reflection of the energy consumption.

On the other hand, more and more research is being conducted, aiming to determine the cost forecasts and the comparison with the investment needed to diminish the operating costs of the building, in such an extend, that the International Accounting Standards (IAS 40, Transfer of Investment Property) especially when “fair value” evaluation is at stake in contrast of the cost model.

2 Selected publications review

There are far too many publications about the cost benefit analysis of investments in designing and constructing buildings with a low energy consumption, so literature review will be limited to some representative once.

European Union regulations have been adopted by all of the member states, as a tool to diminish the greenhouse effect and thus the climate change.

It is not surprising that many of the papers published come from Mediterranean countries, because of the simultaneous needs for heating in the winter and cooling in summer.

2.1 Papers review

In a paper about the policies for sustainable Buildings [1] the constraints and opportunities of the adoption of further energy efficiency measurements would increase the value of the buildings because the efficiency could be easily perceived by the potential users.

Another important paper which is not yet published, written for the Swiss Federal Office of Energy, is dealing with the willingness to pay more for either buying a house or renting it, in correlation with its energy efficiency [2]. The research behind the paper has been conducted in Switzerland, and has shown that potential users would pay up to 13% for a better ventilation system, while they would bear a 3% for enhanced insulation and thus better energetic performance.

At a presentation at the Conference in May 2018, the subject of consideration of the insulation systems using natural fibers [3] is examined and stressed that this way the environmental impact is minimal, the costs of insulation is lower and the degree of insulation is similar, thus creating value.

Bioclimatic building is the subject of another paper [4] is examining the different needs for energy, depending on the geographic indicators (Latitude – Altitude) which may add up to 17% of energy efficiency. The researchers show that in warmer climates the buildings are more energy efficient and that the energy efficiency is (surprisingly) depends on the volume of the building.

The energy efficiency of historic buildings is discussed [5] and shows that energy efficiency is quite high because of the thickness of the walls.

Net present value (NPV) and Internal Rate of Return are discussed [6] concerning typical Greek houses. They sustain that energy efficiency is highly increased by changing the artificial lighting.

A decision making tool is presented [7] and the multi-objective with many constraints and also arbitrary assumptions, affect the validity, although the model is quite accurate.

A book review [8] is examining the Instrumental Energy Diagnosis based on the envelope characteristics, as a universal tool.

A first approach to the results of the new legislation about energy efficiency in Greece [9] has shown little effects because the slowdown of the building (and renovation) business, affected by the deep economic recession.

Uncertainty is displayed as a major obstacle [10] for calculations of the present value of future cash – flow variation in dependence of the energy efficiency difference from average constructions.

Many tools have been developed aiming to calculate the benefits from energy efficiency, most reported at the Greek Observatory [11].

2.2 Interview with brokers

In 2016 the bioclimatic upgrade of a quarter of the town of Serres was delivered and it was thought that the prices would increase, because of lower needs for cooling.

In the same time, after discussing with the property brokers, we came up with the idea of interviewing some of them in the Region of Central Macedonia in order to get an idea about the importance of energy efficiency of potential buyers or tenants.

More than 50 brokers have been interviewed, distributed between Serres, Thessaloniki and Chalkidiki.

The general idea is that in Chalkidiki, where most of the houses are used as vacation residences, mostly at summer and because the temperature by the sea is lower than in the cities (2-4 degrees) the potential users did not consider to pay more for energy efficient buildings.

In Thessaloniki, the major concern of the potential users was not the energy efficiency, but the availability of parking lot.

At a contrary, in Serres has been reported that there was energy efficiency awareness, mostly for heating, because of colder and longer winter.

2.3 Discussion

Although the energy efficiency and the relative performance of the buildings are employing many Engineers and Economists, the general awareness is still very low. The perception of the non professional buyers or tenants of the cost of usage of the building is not understandable.

Professional users of buildings, on the other hand (such as Clinics, private Schools, malls etc.) are very much sensitive to energy efficiency, because they calculate all the cost items before building, buying or renting.

Whatever the reservations about the calculators of the benefits of energy efficiency, it seems advisable to use one.

Energy efficiency in the European Countries has been standardized, but it does not give enough information about the energy needs of the buildings.

The tool available may be the ITACA protocol, which would provide quantitative basis for energy consumption of the buildings, among other information.

3 Conclusions

Energy efficiency of the buildings, together with the transportation, will be the main issue of scientists and policy makers, not just for the climatic change but also the limited quantities of fossil fuels.

Most of the buildings are used for private housing, so it is necessary to create awareness of the general public about the benefits of energy efficiency, even only in economic terms.

Public Administration has to take into consideration the cost of usage of public buildings and invest in upgrading their property, if they want to cut local taxes and make their cities attractive.

References

- 1: Olivito, R., Neagoe, M., Mihai, P., Karanasios, N., Kridlova Burdovà, E., Della Puppa, M., P.A.E.S. Project and Housing Policies for Sustainable Buildings, 2017
- 2: Banfi S., Farsi M., Filippini M., Jakob M., Willingness to Pay for Energy - Saving Measures in Residential Buildings,
- 3: Olivito R., Codispoti R., Natural fibers: a valid solution for sustainable reinforcement interventions for masonry structures, 2018
- 4: Tzikopoulos A., Karatza M., Paravantis J., Modeling Energy efficiency of bioclimatic buildings, 2004
- 5: Magrini A., Franco G., Guerrini M., The impact of energy performance improvement of historic buildings on the environmental sustainability, 2015
- 6: Nikolaidis Y., Pilavachi P., Chletsis A., Economic evaluation of energy saving measures in a common type Greek building, 2016
- 7: Diakaki C., Grigoroudis E., Kabelis N., Kolokotsa D., Kalaitzakis K., Stavrakakis G., A multi-objective model for the improvement of energy efficiency in buildings, 2010
- 8: Lucchi Elena, Diagnosi energetica strumentale degli edifici, 2012
- 9: Papamanolis N., The first indicators of the effects of the new legislation concerning the energy performance of buildings on renewable energy applications in buildings in Greece, 2015
- 10: Kumbaroglou G., Madlener R., Avaluation of Economically Optimal Retrofit Investment Options for Energy Savings in Buildings, 2011
- 11: , Typology Approach for Building Stock Energy Assessment, 2012