EFFECTIVE USE OF RESOURCES IN TOURIST FACILITIES – FOCUS ON ENERGY EFFICIENCY

Scientific paper

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Abstract
Purpose – The purpose of the research is to examine the awareness of hoteliers on energy efficiency and environmental protection. The authors wanted to know whether the hotel companies in the inner regions of Istria and Kvarner implement or plan to implement energy efficiency measures in order to use their resources more rationally.
Design - Every hotel company should act responsibly towards the environment, i.e. be an active participant in sustainable development while preserving natural resources. This represents a great challenge, but also a great economic cost for each individual company.
Methodology / Approach – Empirical research was conducted using a simple questionnaire adapted to the target group (tourism management, facility management). The study was conducted in December 2013, in the tourist destinations of Kvarner and Istria, on a sample of 15 hotels. The first part of the questionnaire is close-ended (with offered answers: yes, no, sometimes), while the second part of the survey is descriptive, or open-ended. The method of data collection was self-completion questionnaire, returned by e-mail or personally collected by the researchers at the hotel manager. The collected questionnaires were encrypted and statistically analysed. Another often used method of data collection was one-to-one interview.
Findings – It is indicative that there is an increasing awareness of people employed in tourism about the fact that energy efficiency represents both the future and the necessity of business. In contrast, there is a lack of energy management, as well as of planning and investment in the energy efficient technologies. Concrete energy efficiency measures are poorly implemented into business.
Originality of the research – This research provides reliable and actual qualitative and quantitative data about the problems of energy efficiency development, as well as the energy- and cost saving in the regions of Istria and Kvarner.
Keywords effective use of resources, energy efficiency, economic savings, green business, tourism

INTRODUCTION

In the last few decades, mankind is becoming increasingly aware of the problems of global warming, climate change and the greenhouse effect.[1] Accordingly, since buildings are among the largest energy consumers and as such have a major impact on the environment, the use of renewable energy sources and energy efficiency has become an imperative of modern construction. Therefore, it is necessary to foster awareness of the need for multiple energy savings on all levels, and thus automatically contribute to the protection of the environment, i.e. the conservation of nature and

[1] Lin, B., Xuehui, L., „The effect of carbon tax on per capita CO2 emissions“, *Energy Policy*, Vol. 39, 2011, 5139.

mankind.[2] Energy efficiency is a measure that shows how much the implemented measure and technologies contribute to the reduction of energy and / or fuel consumption, such as domestic energy consumption or the production of a certain product.[3] Energy efficiency is the fundamental objective of energy policy and the cornerstone for mitigating climate change and achieving sustainable development.[4] Efficient use of energy implies the application of energy-efficient materials, devices, systems and technologies available on the market, with the aim of reducing energy consumption while achieving the same effect (heating, cooling, lighting, cooking, laundry...).[5] Efficiency is a term often used in everyday life, as well as in a variety of activities, from economy to energetics. In general, it can be said that efficiency is the ability to achieve the desired results with the least possible losses (of time, money, energy). Therefore, efficient energy use means using it with the least possible losses, or achieving the desired result with the least consumption of energy. In other words, energy efficiency means using a smaller amount of energy to perform the same job or function (heating or cooling, lighting, various types of production, powering vehicles, etc.) [6] The concept of energy efficiency encompasses the efficient use of energy in all sectors of final energy consumption: industry, trade, services, agriculture and households. Energy efficiency should by no means be understood as energy saving. Namely, saving always implies certain sacrifices, while the efficient use of energy never distorts the working and living conditions.[7] However, these terms are also used to describe the activity that brings the desired result, regardless of its characteristics and the related losses. The essence of energy efficiency lies in the developed awareness in the minds of people and their willingness to change the established habits towards energy-efficient solutions, but also in the complex technical solutions that enable the achievement of energy efficiency.[8] Energy production and its use have a significant effect on the environment, causing both local and regional pollution, as well as global issues such as global warming and climate change. Energy production is always dictated by its consumption, so careless, inefficient consumption causes unnecessarily high production, and thus an unnecessarily large negative impact on the environment.[9] A good example of energy saving in building a hotel would be a good thermal insulation of the walls. The construction industry accounts for about 40% of the total energy consumption,[10] which makes it the largest energy consumer, when compared to other sectors (industry, transport). Especially disturbing is the fact that this energy consumption constantly continues to grow, resulting from an increased standard of

[2] Fang, G., Tian, L., Fu, M., Sun, M., „The impacts of carbon tax on energy intensity and economic growth – A dynamic evolution analysis on the case of China“, *Applied Energy*, Vol. 110, 2013., 17-28.
[3] International Energy Agency http://www.iea.org/topics/energyefficiency/ (01/02/2014).
[4] Horng, J.S. et al., „Energy saving and carbon reduction management indicators for natural attractions: a case study in Taiwan“, *Journal of Sustainable Tourism,* Vol. 20, No. 8, 2012, 1126.
[5] Itani, T., Ghaddar, N., Ghali, K., „Strategies for reducing energy consumption in existing office buildings“, *International Journal of Sustainable Energy,* Vol. 32, No.4. 2013., 259-275.
[6] Project “Poticanje energetske efikasnosti u Hrvatskoj” , http://www.ee.undp.hr/o-projektu/zasto-energetska-efikasnost (01/02/2014).
[7] Achtnicht, M., „Do environmental benefit matter? Evidence from a choice experiment among house owners in Germany“, *Ecological Economics*, Vol. 70, 11, 2011, 2192.
[8] Ghosh, N.K., Blackhurst, M., „Energy savings and the rebound effect with multiple energy services and efficiency correlation“, Ecological Economics, Vol.105, 2014., 58.
[9] Energy Efficiency Indicators: Essentials for Policy Making, OECD/IEA, International Energy Agency, 2014.
[10] Buildings and Climate Change, UNEP DTIE, United Nations Environment Programme, 2009., 3.

living. On the other hand, however, there is a comforting fact that the construction industry sector has the largest potential for energy saving and consequent environmental benefits. This sector can significantly reduce energy consumption, thanks to the knowledge of architectural and civil engineering, the available building materials and the contractors who are able to implement energy efficiency measures into practice.[11] A rational use of energy in the construction industry means constructing buildings that would maximize energy saving and minimize its consumption. Of all energy types, buildings consume the most energy for heating and, due to global warming, cooling. Energy efficiency involves a series of steps, including:[12]

- establishing an initial baseline for energy consumption by collecting past data, usually from energy bills;
- observing and analysing current practices and setting objectives and targets to reduce the amount of energy used;
- implementing the changes needed to meet the set objectives and targets, as well as educating staff on their role in being energy efficient;
- monitoring and recording energy consumption on a daily, weekly, monthly and annual basis,
- checking progress and taking action where needed.

With regard to the above-mentioned, the *aim* of this paper is to present a successful implementation of energy efficiency in small and medium-sized enterprises in the world, as well the gathered views of hoteliers on the implementation of energy efficiency in their businesses. *The task* of this paper is to prove the thesis that the introduction of energy efficiency involves a series of measures implemented in order to better exploit the available energy and thus minimise the impact on the environment. Regular consumption monitoring, combined with the necessary specialized knowledge, technology and human resources potential, can produce significant energy efficiency effects.

The paper is divided into two chapters, in addition to the introduction. The first part provides a description of the particular energy conservation measures in hotels that have successfully implemented the technology of energy efficiency, in both European countries and in Croatia. The second part presents a research based on following **methodology.** Empirical research was conducted using a simple questionnaire adapted to the target group (tourism management, facility management). The study was conducted in December 2013, in the tourist destinations of Kvarner and Istria, on a sample of 15 hotels. The first part of the questionnaire is close-ended (with offered answers: yes, no, sometimes), while the second part of the survey is descriptive, or open-ended. The method of data collection was self-completion questionnaire, returned by e-mail or personally collected by the researchers at the hotel manager. The collected

[11] Annunziata, E., Rizzi, F., Frey, M., „Enhancing energy efficiency in public buildings: The role of local energy audit programmes“, *Energy Policy,* Vo. 69, 2014., 370.
[12] LIFELONG LEARNING PROGRAMME, LEONARDO DA VINCI Transfer of innovation CSR TOUR "Corporate Social Responsibility Training and Certification in the Travel Sector", Project Nr: 2012-1-HR1-LEO05-01703 http://www.travelife.info/uploads/csr/1392153659_Travelife%20-%20Factsheet%201%20-%20Energy%20Efficiency.pdf (01/02/2014).

questionnaires were encrypted and statistically analysed. Another often used method of data collection was one-to-one interview.

The analysis proved a lack of energy management, a lack planning and investment in renewable energy sources, as well as a lack of education and awareness of all forms of renewable energy. The conclusion suggests the need to increase energy efficiency in a tourist destination, through the application of European and Croatian energy strategies. This would, along with economic and social development, simultaneously develop and improve the ecological system, which implies life cycle assessment – methods for assessing environmental impacts.[13]

1. SUCCESSFUL ENERGY EFFICIENCY TECHNOLOGIES INTEGRATION INTO SMALL AND MEDIUM ENTERPRISES

This paper presents some successful examples of hotels that have implemented energy efficiency technology, mostly small and medium hotels in France, England, Italy, Portugal, Switzerland and Bulgaria. [14] Their first and most important step is to make the initial assessment, i.e. gather readings of energy consumed on a monthly basis, as well as readings of the electricity consumed within a one-year period, the average electricity consumption per room, and the average consumption during the night. Emissions of carbon dioxide were also measured. On average, the hotels with higher service quality level produce higher CO2 emissions per person/night.[15] These measures can help make a good estimate for future projects. The hotels involve their employees in the business, but also their guests in the project. This is done mostly through various environmental education courses for the employees, advising them on the right temperature in the rooms during the summer and winter, etc.[16] One of the most important measures to be taken is insulating the building against extreme temperatures (both heat and cold), since that saves the most energy. The next step is changing the efficiency of equipment, from light bulbs to kitchen equipment. The regular light bulbs are replaced by energy-saving light bulbs, connected to the automatic lighting system in the rooms; the office technology uses the stand-by option; the refrigerators and freezers are A+ / A++ class, consuming less energy, etc. In this way, energy consumption is reduced, as well as the carbon dioxide emissions and other expenses in general. These measures also contribute to the increase in the competitiveness on the market, and the satisfaction of hotel guests. In this way, the hotel becomes recognizable, both within the destination and on the tourist market. In order to accomplish this, it is necessary to implement the measures developed through an interdisciplinary cooperation between various sectors, as well as certain state policy measures.[17] A positive example of recognising

[13] Camillis, C., Raggi, A., Petti, L., "Tourism LCA. State-of the art and perspectives", Societal Life Cycle Assesment,15, 2010., 148.
[14] Hotel Energy Solutions, Best Practices Guide: Successful Energy Efficiency Technologies Intergration in SME Hotels, Hotel Energy Solutions project publications, UNWTO ELibrary, 2011.
[15] Tsai, K., Lin, T., Hwang, R., Huang, Y., "Carbon dioxide emissions generated by energy consumption of hotels and homestay facilities in Taiwan", *Tourism Management*, Vol. 42., 2014, 13.
[16] Chou, C.J., „Hotels´environmental policies and employee personal environmental beliefs: Interactions and outcomes", *Tourism Management,*Vol. 40, 2014., 438.
[17] Filippini, M., Hunt, L.C., Zorić, J., „Impact of energy policy instruments on the estimated level of underlying energy efficiency in the EU residential sector, *Energy Policy,* Vol. 69., 2014, 78.

cooperative organisations as important generators of economic and social development in the Republic of Croatia is the initiative of the Ministry of Entrepreneurship and Crafts, "Entrepreneurial impulse 2013", launched in February 2013, and aiming at supporting entrepreneurial activities of small and medium Croatian enterprises. One of the supported activities is cooperative entrepreneurship[18], which would facilitate the small and medium enterprises to achieve positive business results.

Table 1: **Description of energy conservation measures in SME hotels**

MEASURES	DESCRIPTION
Make a first assessment	Energy consumption monitoring: energy sub-metering systems, with bi-monthly reading, installed to assure monitoring of energy consumption in the main office, the guest rooms and the technical office. Carbon dioxide emission is also measured.
Involve your staff	The staff is educated about the environmental impact of the hotel; the staff also receives some practical advice on: recommended temperature levels, recommended load for washing machines etc. In addition, the staff is also encouraged to find solutions to consuming less energy and reducing the hotel's environmental impact.
Involve your guests	The guests are informed on good housekeeping practices, including recommended temperature levels. It is also essential to communicate the non-visible efforts made, such as generating electricity from renewable sources. A TV in the entrance hall provides information on the hotel's environmental action plan.
Protect the building from extreme temperatures	Using thermal building insulation, such as double-glazed windows
Improve equipment efficiency	A computer alarm indicates when the lighting in the entrance hall can be switched off. The installation of time controls and occupancy sensors in other parts of the hotel is also under study. An "economy box" shuts down electricity when the guests leave their rooms. The standby mode is used for office computers. The refrigerators and freezers are A+/A++ energy class. A control power circuit breaker which shuts down heating when the window is opened can also be installed.

Source: Hotel Energy Solutions, Best Practices Guide: Successful Energy Efficiency Technologies Integration in SME Hotels, Hotel Energy Solutions project publications, UNWTO E-Library, 2011, pp. 5-59.

[18] Perić, M., Đurkin, J., "Cooperative Based Organisational Structures: Implications for Croatian Tourism", Proceedings of 2nd International scientific conference "*Tourism in Southern and Eastern Europe 2013*", Faculty of Tourism and Hospitality Management, Opatija, 2013, 315.

In addition to the ecological, the hotels have achieved economic savings. The following Table 2 provides information on the cost of some of the energy saving measures, on the example of the hotel "La Perouse" in France, implemented in the recent years. The hotel was built in 1993. It's a private 3-star city hotel. The hotel provides services: B&B, air conditioning. It's mid-sized hotel with 46 guest rooms. Regarding environmental aspects the hotel has, since November 2007, following environmental labels: Green key and EU Eco-label. Great improvements were made by implementing "towel agreement policy" and by obtaining the Green Key label and the EU Eco-label for his hotel.[19]

Table 2: **The cost of some energy saving measures**

	Costs (€ without tax)
Water saving devices	1,235
Hot water closed loop	12,171
Sub meters (water and energy)	1,040
Low energy consumption lights	487
Replacement of refrigerator and freezer	2,000
Fees for qualifying for Eco label	1,500
Fees for qualifying for Green Key	50
TOTAL	14,064

Source: Hotel Energy Solutions, Best Practices Guide: Successful Energy Efficiency Technologies Integration in SME Hotels, Hotel Energy Solutions project publications, UNWTO E-Library, 2011, 8.

The table gives proof of the economic benefit for the company. Economic performance, characterised by continuous improvement and global performance of the business, can be explained as a consequence of the fact that savings are re-invested in new environmental measures to ensure a continuous improvement. Apart from European hotels, special care about energy spending is also taken by other hotels in the world. For instance, one study conducted in a hotel in Hong Kong highlighted that, in order to achieve both operating cost saving and environmental protection, it is recommended that an energy management programme be established, and that key elements of such a programme should be based on the experience of implementing energy conservation strategies in hotels in Hong Kong.[20]

To ensure that all resources are used in accordance with sustainable development, and the implementation of EE (energy efficiency), it is recommended that the hotel companies implement the ISO 50001:2011standard in their business.

[19] Hotel Energy Solutions, Best Practices Guide: Successful Energy Efficiency Technologies Integration in SME Hotels, Hotel Energy Solutions project publications, UNWTO E-Library, 2011, 5.
[20] Shiming, D., Burnett, J., "Energy use and management in hotels in Hong Kong", *International Journal of Hospitality Management*, Vol. 21, Issue 4, 2002, 371.

ISO 50001:2011 – Energy Management System (EnMS)

Energy is something we all need, and which is constantly growing in value, due to the fact that it is a limited resource. ISO 50001:2011 is a newly developed international standard for energy management system (EnMS), which provides a framework for the establishment of energy management to help organizations improve their energy efficiency in a logical, controlled and systematic way. The purpose of the ISO 50001 standard is to enable organizations to establish the systems and processes necessary to improve energy efficiency, use and consumption. The standard specifies that an organization must integrate an energy management system (EnMS), establishing and encouraging energy policy, objectives and action plans, which take into account legal requirements and information related to energy use.[21] ISO 50001 is a standard that specifies what is needed for an energy management system, and is designed to encourage the use of energy technologies and help organizations reduce their energy consumption and save energy. The result should be a reduction of energy costs and carbon emissions. This can be done by introducing an energy policy, planning energy management, and measuring results. The standard also allows the best purchase of energy services, products and equipment. All who wish to reduce their energy costs, carbon emissions, improve the reputation of their organization, and develop a deeper understanding of an internationally recognized energy management, should apply the ISO 50001:2011 standard. The standard specifies the requirements for establishing, implementing, maintaining and improving an energy management system, with a purpose of enabling an organization to follow a systematic approach in achieving continual improvement of energy performance, including energy efficiency, energy use and consumption.

This standard is designed to make it easier for organizations to integrate energy management into their overall efforts to improve quality and environmental management. By using this standard, organizations can:[22]

- Develop a policy for more efficient use of energy
- Fix targets and objectives to meet the policy
- Use data to better understand and make decisions about energy use
- Measure the results
- Review the effectiveness of the policy, and
- Continually improve energy management.

Croatian Example: HOTEL MAESTRAL NOVIGRAD

Hotel Maestral is part of the Laguna Novigrad Ltd., holding tourist facilities in Novigrad and on the island of Korčula: Hotel Maestral, Hotel Laguna, Camp Mareda, Camp Sirena and Hotel Feral. Laguna Novigrad Ltd. exists for more than 40 years and is the leading tourist company in Novigrad. Hotel Maestral has been awarded the certificate "Environmentally Friendly", a national Croatian label awarded for high

[21] ISO (International Organization for Standardization)
http://www.iso.org/iso/catalogue_detail?csnumber=51297 (14/02/2014)
[22] http://www.iso.org/iso/iso50001 (14/02/2014)

environmental standards above the legally prescribed minimum. [23] The establishment of the Croatian system for the Environmental Label award was modelled on the German eco-labelling scheme existing since 1978 and serving as a forerunner of all environmental label schemes in the world. [24] The German Blue Angel Programme is a voluntary, government sponsored scheme which works with the private sector and nongovernmental organisations. [25] Some of the measures taken by the hotel Maestral are listed in the following table.

Table 3: **Environmental measures taken by Hotel Maestral**

Informed guests	Environmental measures displayed in rooms
Informed employees	Environmental measures displayed in employee break room
Waste separation	Recycling bins for plastic / paper / glass
Heating/cooling system	The introduction of heat pumps (a move away from the use of oil)
Temperature regulation	Automatic control from the central computer
Energy saving- "smart rooms"	Automatic control of lighting and air conditioning
Energy saving -solar panels	Implementation in progress (camps already equipped)

Source: data gathered from the interview with Hotel Maestral's management
With each investment, Laguna Novigrad Ltd. takes energy efficiency into account. The hotels Maestral and Feral are currently in the process of certification for the "green" hotel label.

2. CASE STUDY – ENERGY EFFICIENCY IN HOSPITALITY

The aim of the research is to examine the awareness of hoteliers on energy efficiency and environmental protection. The authors wanted to know whether the hotel companies in the inner regions of Istria and Kvarner implement or plan to implement renewable energy sources, whether they have a person in charge of monitoring energy consumption, and whether they implement intelligent business systems in their operations, all with the goal of greater energy saving in the hotel. In the framework of the objectives and priorities of this research, the emphasis is placed on:

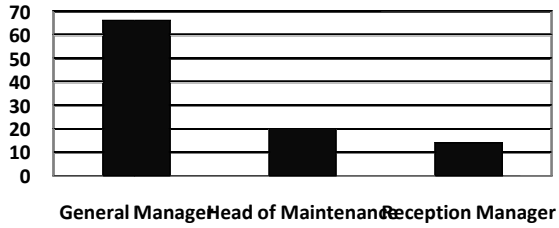
- future energy efficiency measures
- environmental protection and improvement measures.

The study was conducted in two tourist destinations, Kvarner and Istria, in December 2013. The data was collected on a sample of 15 hotels in the tourist destinations of Lovran, Opatija, Poreč and Novigrad. The questionnaire covered the target groups:

[23] http://www.ait.hr/energy.html (01/02/2014)
[24] Ministry of Environmental and Nature Protection http://www.mzoip.hr/default.aspx?id=8668 (01/02/2014)
[25] See more Subedi, S., Environmental Policy: From Regulation to Economic Instruments: International Legal Aspects of Eco-Label, Working Paper Series No. 185, Institute of Social Studies, 1995., 1-40.

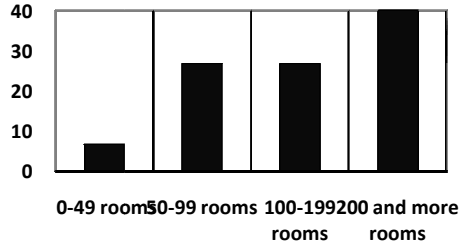
hotel management (hotel general manager) with 66%, head of engineering department (head of maintenance) with 20%, and reception managers with 14% (see Figure No.1). The first part of the questionnaire is close-ended (with offered answers: yes, no, sometimes), while the second part of the survey is descriptive, or open-ended. The method of data collection was self-completion questionnaire, returned by e-mail or personally collected by the researchers at the hotel manager. The research results of the first part are presented graphically, while the results of the second part are descriptive. The research involved five 3-star hotels, nine 4-star hotels and one 5-star hotel.

Figure 1: **Target groups structure**



Source: The author's research results

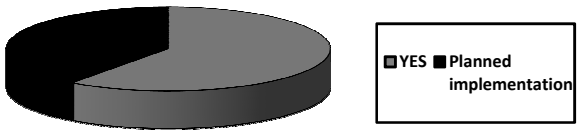
Figure 2: **The structure of surveyed hotels (by number of rooms)**



Source: The author's research results

The majority of the surveyed hotels has over 200 rooms and suites (40% or 6 hotels); the same number of the surveyed hotels has between 50-99 rooms and between 100-199 rooms, while one hotel, or 6.66%, has less than 50 rooms (see Figure 2).

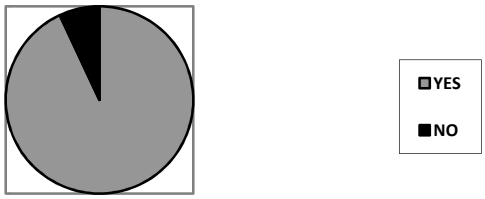
Figure 3: **The use of renewable energy sources in the hotel**



Source: The author's research results

When asked whether renewable energy sources are being used, more than half of the respondents affirmed (60% or 9 respondents), while others replied that the implementation planning is in progress (40% or 6 respondents) (Figure 3). Out of the 60% affirmative answers, 22% said they used solar energy, or solar collectors for domestic hot water heating. It can be concluded from the answers that there is a growing employees' awareness about the fact that renewable energy sources represent both the future and the necessity of business.

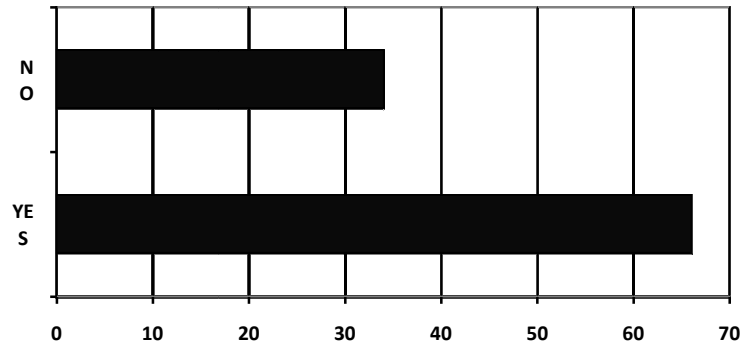
Figure 4: **Employed person in charge of monitoring energy consumption**



Source: The author's research results

Since monitoring energy consumption is a demanding job, 93% or 14 respondents have a person employed on that position, while 7% of the respondents don't have a person in charge of monitoring energy consumption (Figure 4). In most of the surveyed hotels, the person in charge of monitoring energy consumption is head of maintenance or head of engineering department, which raises the question of how much can head of maintenance affect the reduction of energy costs in the hotel. The measures for improving energy efficiency can be introduced in collaboration with the hotel management. It is recommended that the hotels use the services of various energy consultants, such as energy advisors, environmental sustainability directors etc.

Figure 5: **The use of intelligent hotel rooms**



Source: The author's research results

The trends in technology are rapidly evolving and spreading, both in hospitality and in other industries. Thanks to the knowledge and the new technologies, it is possible to use energy in a more rational way within a hotel establishment (starting from a hotel

room as the smallest unit), and to run a business in an environmentally responsible manner. [26] Most of the respondents (66%) confirmed the introduction of intelligent rooms, while the rest 34% have no intelligent systems implemented in their business. Unfortunately, out of those 34%, only one hotel has plans to introduce such a system (Figure 5).

Figure 6: **Familiarisation with the ISO 50001:2011standard**

Source: The author's research results

On the question whether they are familiar with ISO 50001:2011, the majority of the respondents replied negatively (60% or 9 respondents), while the minority (40% or 6 respondents) said they were familiar with the standard (Figure 6). The answers point to the need for constant education, since this norm is relatively new in the field of energy management (EnMS). The implementation of an energy management plan helps a company to:[27]

- Develop a baseline of energy use
- Actively manage energy use and costs
- Reduce emissions without negative effect on operations
- Continue to improve energy use/product output over time
- Document savings for internal and external use (e.g. emission credits)

The second part of the survey was descriptive, with none of the respondents answering the question of what is being done about the energy efficiency of the hotel in the future. It can be concluded that the hoteliers either do not plan their energy future, or that their investments are kept as trade secrets. However, any investment in energy efficiency serves as a means of promotion for both the hotel and the entire destination. The hotel's green business also creates an extra incentive for the guest's arrival.

The last descriptive question, concerning the measures implemented for the protection and improvement of the environment, provided similar answers. The measures implemented in the majority of the hotels are: regular system maintenance in order to reduce harmful gas emissions; wastewater control, proper kitchen oil waste disposal,

[26] Krstinić Nižić, M., Karanović, G., "Importance of intelligent rooms for energy savings in the hotel industry", *Tourism and Hospitality Industry 2008*, Faculty of Tourism and Hospitality Management Opatija, University of Rijeka, 2008, 1255.
[27] Skaggs, J., Implementing an Energy Management System, using ISO 50001, Management System Solutions, 1-8 https://de.dqs-ul.com/fileadmin/files/de2013/Files/Standards/Nachhaltigkeit/Umwelt-_und_Energiemanagement/ISO_50001/DQS_ISO50001_Einf%C3%BChrung_JSkaggs.pdf (01/04/2014).

waste separation, informing the guests and employees. From these answers, it can be concluded that the majority of hoteliers in Istria and Primorje-Gorski Kotar County implement environmental measures required by law, probably for the fear of inspection services and large fines for not meeting all legal obligations. This way of conducting business obliges the hotels to introduce energy efficiency as a normative regulation.

CONCLUSION

The implementation of energy efficiency measures can bring the hotel a number of advantages, not only environmental but economic as well. Energy management starts by collecting the necessary energy consumption data. This way the hotel gathers all the information necessary for starting an energy efficiency project, determining the measurable results of efficiency, conducting energy audits and energy certification, identifying energy saving opportunities, introducing a system of energy saving and calculating the costs and investment amortization period.

Hotels are large energy consumers, and the study conducted in Istria and Primorje-Gorski Kotar County has proven that there is a lack of energy management, as well as of planning and investment in the energy efficient technologies. From the responses, it can be concluded that energy efficiency awareness exists at all levels of management. However, what is worrying is that these measures are only partially or rarely implemented. The reasons for this are manifold: insufficiently harmonized legislation in the field of energy and environmental protection, insufficient financial incentives to stimulate EE, and the very high initial cost of investment. All of these reasons repel the hotel managers from engaging in the area of energy management (EnMS). This situation could change by continuous education and state incentives. By introducing environmental solutions and the use of environmentally friendly products, hotel companies demonstrate their environmental responsibility and further increase their earnings by saving on "green solutions." This attracts a larger number of guests who appreciate the environmental acceptability as an additional quality of products and services. In this way, not only the hotel, but also the entire destination profits, not just from their new image, but also from a more efficient and rational use of their resources.

We can conclude that there is a need to introduce strategic investment plans that will provide continuous investments in the improvement of existing facilities and infrastructure with the introduction of renewable energy sources. Only the companies that invest in their employees' education and act in accordance with sustainable economic growth can achieve positive results and ensure their positions in the increasingly demanding market.

REFERENCES

Book:

Buildings and Climate Change, UNEP DTIE, United Nations Environment Programme, 2009.

Energy Efficiency Indicators: Essentials for Policy Making, OECD/IEA, International Energy Agency, 2014.

Hotel Energy Solutions, Best Practices Guide: *Successful Energy Efficiency Technologies Integration in SME Hotels*, Hotel Energy Solutions project publications, UNWTO E-Library, 2011.

Hotel Energy Solutions, *Energy Efficiency and Renewable Energy Applications in the Hotel Sector*, Hotel Energy Solutions project publications, UNWTO E-Library, 2011.

Journal article:

Achtnicht, M., „Do environmental benefit matter? Evidence from a choice experiment among house owners in Germany", *Ecological Economics*, Vol. 70, 11, 2011, 2191-2200.

Annunziata, E., Rizzi, F., Frey, M., „Enhancing energy efficiency in public buildings: The role of local energy audit programmes", *Energy Policy,* Vo. 69, 2014., 364-373.

Camillis, C., Raggi, A., Petti, L., "Tourism LCA. State-of the art and perspectives", Societal Life Cycle Assesment, 2010., 15: 148-155.

Chou, C.J., „Hotels´environmental policies and employee personal environmental beliefs: Interactions and outcomes", *Tourism Management,*Vol.40, 2014., 436-446.

Fang, G., Tian, L., Fu, M., Sun, M., „The impacts of carbon tax on energy intensity and economic growth – A dynamic evolution analysis on the case of China", *Applied Energy*, Vol. 110, 2013., 17-28.

Filippini, M., Hunt, L.C., Zorić, J., „Impact of energy policy instruments on the estimated level of underlying energy efficiency in the EU residential sector, *Energy Policy,* Vol. 69., 2014, 73-81.

Ghosh, N.K., Blackhurst, M., „Energy savings and the rebound effect with multiple energy services and efficiency correlation", Ecological Economics, Vol.105, 2014., 55-66.

Horng, J.S. et al., „Energy saving and carbon reduction management indicators for natural attractions: a case study in Taiwan", *Journal of Sustainable Tourism,* Vol. 20, No.8, 2012, 1125-1149.

Itani, T., Ghaddar, N., Ghali, K., „Strategies for reducing energy consumption in existing office buildings", *International Journal of Sustainable Energy,* Vol. 32, No.4.2013., 259-275.

Krstinić Nižić, M., Karanović, G., "Importance of Intelligent Rooms for Energy Savings in the Hotel Industry", *Tourism and Hospitality Industry 2008*, Faculty of Tourism and Hospitality Management Opatija, University of Rijeka, 2008., 1251-1263.

Lin, B., Xuehui, L., „The effect of carbon tax on per capita CO2 emissions", *Energy Policy*, Vol. 39, 2011., 5137-5146.

Perić, M., Đurkin, J., "Cooperative Based Organisational Structures: Implications for Croatian Tourism", Proceedings of 2nd International scientific conference "*Tourism in Southern and Eastern Europe 2013*", Faculty of Tourism and Hospitality Management, Opatija, 2013., 305-317.

Shiming, D., Burnett, J., "Energy Use and Management in Hotels in Hong Kong", *International Journal of Hospitality Management*, Vol. 21, Issue 4, 2002., 371-380.

Subedi, S., Environmental Policy: From Regulation to Economic Instruments: International Legal Aspects of Eco-Label, Working Paper Series No. 185, Institute of Social Studies, 1995., 1-40

Tsai, K., Lin, T., Hwang, R., Huang, Y., „Carbon Dioxide Emissions Generated by Energy Consumption of Hotels and Homestay Facilities in Taiwan", *Tourism Management*, Vol. 42, 2014., 13-21.

Other:

International Energy Agency (IEA) http://www.iea.org/topics/energyefficiency/ (01/02/2014)

Project "Poticanje energetske efikasnosti u Hrvatskoj", http://www.ee.undp.hr/o-projektu/zasto-energetska-efikasnost (01/02/2014)

LIFELONG LEARNING PROGRAMME, LEONARDO DA VINCI Transfer of innovation CSR TOUR „Corporate Social Responsibility Training and Certification in the Travel Sector", Project Nr: 2012-1-HR1-LEO05-01703 http://www.travelife.info/uploads/csr/1392153659_Travelife%20-%20Factsheet%201%20-%20Energy%20Efficiency.pdf (01/02/2014)

ISO (International Organization for Standardization) http://www.iso.org/iso/catalogue_detail?csnumber=51297 (14/02/2014)

http://www.iso.org/iso/iso50001 (14/02/2014)

http://www.ait.hr/energy.html (01/02/2014)

Ministry of Environmental and Nature Protection http://www.mzoip.hr/default.aspx?id=8668 (01/02/2014)

Skaggs, J., Implementing an Energy Management System, using ISO 50001, Management System Solutions, pp 1-8. https://de.dqs-ul.com/fileadmin/files/de2013/Files/Standards/Nachhaltigkeit/Umwelt_ und _Energiemanagement/ISO_50001/DQS_ISO50001_Einf%C3%BChrung_JSkaggs.pdf (01/04/2014).

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