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## Problems and Directions of Application of Environmental Technologies in the Service Sector

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### Abstract

The problem of the environmental technologies introduction in all spheres of the modern economy, including the service sector, are of particular relevance due to the increase of environmental problems worldwide. The purpose of this research is the identification and synthesis of scientific and theoretical data on the existing studies and implementation of environmental technologies in the service sector, as well as the development of measures for their minimization or elimination on the example of establishments providing hospitality and tourist services. For the issue analysis we have used empirical theoretical methods, methods for qualitative and quantitative analysis, methods of data aggregation, factor and structural-functional analysis, classification and structuring of informational, reference and statistical data, mapping method. As a result of the study we summarized scientific and theoretical basis to determine the nature of «environmental technology» concept. As a result, we clarified the details of this concept. The authors summarized the advanced international and Russian practice of environmental technologies implementation in the field of tourism and hospitality services sphere. They justified the directions of environmental technologies implementation activities in the service sector. We suggested measures to reduce heat energy losses, to save energy consumption, improve the efficiency of the heating, ventilation and air conditioning systems. The article will be useful for both service businesses that are interested in the environmental technologies introduction, as well as regional government bodies specialized in environmental and conservation initiatives.

**Keywords:** environmental technologies, environmental management, resource saving, hospitality service, hotels and tourism

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### INTRODUCTION

The main purpose of any enterprise operation is to meet customer needs and maximize profits, and hospitality industry is no exception in this regard. However, in pursuit of profit, we must not forget about the environmental damage caused by economic activity (Chernyavskaya et al. 2016).

The main goal of environmental protection is to establish harmony between the mankind development and the favorable state of the environment. International community worked out a stable development concept for creating this harmony, that gives a lot of attention to the environmentally friendly

technologies introduction into organizations economic activities (Tsybykov 2014).

Integrating environmental considerations into sustainable development of tourism, hospitality and other service sectors, involves meeting the needs of customers and tourists, while protecting and enhancing opportunities for their development in the future. This objective seems attainable, since tourism development is intended to minimize negative impact on the socio-cultural tourist destinations development, as well as to contribute to the preservation of historical, cultural and natural heritage in the field of tourism display (Efimov 2016). Such activities are fully compatible with the

**Table 1.** Basic scientific approaches to the essence definition for the and ‘environmental technology’ concept

No	Concept definition	Author and source
1	Environmental technology is a complex of formalized regulated procedures, actions, movements to reduce technogenic load on the environment.	Telemtaev (2013)
2	Environmental technology (Ecotechnology), green technology, clean technology - all these terms refer to the application of science for the environment, for the purpose of retaining of environment and the planet’s resources, as well as negative impact control of humanity on nature.	Nezdoyminov (2013)
3	Environmental technology is environmental, rehabilitation and production (eco-friendly) technologies, using of which allow to decrease the technogenic load on environment to the level of environmental safety.	Polishchuk (2013)

economic component. Active transition to clean technologies and protection of resources, high level of waste recycling is not only costs, but in the long term perspective will give a real economic impact.

For example, investment in “greening” the tourism sector can be replenished by savings in operating costs. Savings from reduced operating costs as a result of environmental practices (compared to investment) changes in the range from 174% (the operating efficiency of the hotel buildings) to 707% (biodiversity savings) (Ringbeck et al. 2016).

#### METHODOLOGICAL FRAMEWORK

To study issue directions and ecological technology application prospects in the service area the authors used methods of factor and structural-functional analysis, complex analysis, expert assessment, classification and structuring of informational, reference and statistical data, mapping method and others.

Based on theoretical and empirical methods, it was revealed that one of the ambiguously interpreted definitions in the scientific literature is the essence of “environmental technologies” concepts and approaches to their classification. Therefore, the task was to clarify the definition of this concept and to reveal the peculiarities of environmental technologies in the service sector.

The regulatory legal basis for the study comprised the Federal Law of January 10 (2002). №7-FL “On Environmental Protection”, international standard ISO 14001 (Environmental Management System), ISO 14024 (Environmental management, 2016), GOST R ISO 14000 (2016) (environmental management series of standards), as well as Methodological position of voluntary environmental certification system “Leaf of Life,” developed by “St. Petersburg Ecological Union”).

## RESULTS AND DISCUSSIONS

### Scientific and Theoretical Foundations of the Essence Definition for the “Environmental Technology” Concept

Usually, the technology is understood as a set of techniques and ways to obtain, process or recycle (change of state, properties, shape) raw materials, materials, semi-finished products or products in various industries, construction, services and other economic sectors.

The term “environmental technology” in the scientific literature currently has multiple definitions. **Table 1** shows the basic scientific approaches to the essence definition for the ‘environmental technology’ concept.

Thus, referring to **Table 1** it can be concluded that under those environmental technologies scientists understand the complex events, the main purpose of which is to minimize the negative impact of any production on the environment.

One of the most effective ways to achieve results in the field of using environmental technology is the production ecological management development and environmental management systems. At the same time, environmental management essence is considered by scientists in different ways - either as a reaction to emerging problems in the surrounding area, or as a system of measures to manage the environmental problems prevention.

Supporter of the first approach are Gray et al (2014), considering ecological management as a set of reactions from the companies to environmental issues when assessing their position in relation to the environment, development, and densification policies and strategies aimed at improving this position, accompanied by the management systems change, in order to ensure improvement and efficient control.

Solovyova et al. (2013) give the definition of “environmental management” as the relationship system and at the same time as a set of methods that

control warnings and solution of various natural resource and environmental problems arising at different levels of the economic hierarchy - from enterprises and municipalities to national and global economy.

#### **Advanced International and Russian Practices of Introducing Environmental Technologies in Tourism and Hotel Services**

The study of international environmental technology adoption practices in the services sector allowed to identify several organizations specializing in development and implementation of an environmental management system in the service sector, particularly in the hospitality industry:

- British Airways Holiday (BAH) is one of the world's largest touroperator. The company made its first attempt to develop common requirements for

all hotels and implementation of environmental management.

- Certification for Sustainable Tourism (CST) is one of the most successful companies in the world in the implementation of the ecotourism practices in the Western Hemisphere. Organization experts give an assessment of socio-economic effect from the hotel enterprise work in the region; in order to obtain a sign of eco-quality, the hotel needs to minimize the negative effect exerted by its economic activity.

- Green Global is a British organization dedicated to the promotion of eco-tourism, a member of the Tourism Organization in the United Nations and the World Council for Tourism and travel. For enterprise certification hotel is to comply with the basic requirements for the ecological management system implementation, waste reduction, energy saving technologies, social and cultural development of the territory in which the hotel is located, and its impact on the environment.

- Green Key is a Danish company, working with certification of accommodation collective means, catering services and congress centers. For getting ecomark GreenKey enterprise must implement a system of resources reuse, introduce the terms of consumption and water save, purchase organic products, comply with strict requirements for the food organization. In addition, there are requirements for working with disabled people. Currently organization includes 97 members, ecolabelling Green Key awarded 2,700 organizations in 56 countries.

In terms of the hotel enterprises environmental management, Russia is still significantly behind its foreign counterparts. Russian environmental and industry legislation does not contain any strict environmental requirements. Despite this, in recent years, significant progress has been made in this direction, voluntary certification has been developing quite actively (Larionova 2014).

Since 2010, the program is running voluntary certification "Vitality Leaf", developed by the non-profit partnership "St. Petersburg Ecological union." This program is based on international standards, but considers the special features of modern Russian market. The standard includes 26 compulsory and 66 additional requirements, which contain the compliance with environmental law, the presence of ecological management and environmental policy accommodation facilities, waste, natural resources preservation, the use of safe household chemicals and menu of ecological products in the hotel restaurant (Norkina 2017). Currently, 20 hotels in Russia are certified by the Green Key system, mainly representatives of major international networks, such as Park Inn, Radisson (Avvakumova and Nazarova 2018). Besides, such international networks like Marriott or Radisson already cannot imagine conducting business without using environmental strategies. This trend in the future will strengthen all over the world, and Russia is no exception, although at this stage of local market of hotel services is far behind Western standards.

#### **Directions for the Environmental Technologies Implementation in the Service Sector**

In accordance with the international standards ISO 14001 (environmental management system) measures for the environmental technologies implementation in four key areas are developed: resources preservation and energy efficiency, waste work, minimization of damage from household chemicals, food work points optimization in terms of environmental impacts (Bugaeva 2016).

Saving resource consumption for the hotel enterprise must start with energy auditing. At this stage, it is necessary to assess the magnitude of the electricity and heat losses, to identify their causes and to develop ways of leveling these losses, reducing resource consumption.

There are two ways to optimize resource costs: passive with solution basic problems (gas leakages, water, heat losses), and active with implementation of automatic power system resources management.

According to estimates, only the basic arrangements without cash investment in technological equipment can achieve reductions in consumption for 15-20% (Polishchuk 2013). In order to save energy in the area of heat supply, ventilation and air conditioning, it is necessary to conduct thermal insulation of the building facade and partitions in the hotel, this can reduce utility bills by 40-60% (Orlova 2015).

Based on a study of advanced practices in the environmental technologies implementation in hotels and other service enterprises (Apevalova and Kutyeva 2015, Galenko and Krivoruchko 2018, Lapenko 2016, Ogneva and Nisht 2011, Pecheritsa 2013, Samokhina 2014, Savchenko and Burtsev 2011, Shamarina and Semyachkov 2015) the authors of the article have identified the following most effective measures to reduce heat losses: the installation of multi-pane windows, installation of window constructions with air exhaust through inter-glass space, air dampers installation, curtains in the lobby (office), building facade and overlap het insulation.

To save energy consumption, it is most promising to install infrared and ultrasonic motion sensors, sensors for automatic and remote control of lighting, using only LED and fluorescent lamps to illuminate rooms, regular and systematic cleaning of window glasses, lamps and motion sensors, the use of energy-saving household appliances class a +, a ++, as well as automatic light breakers installation.

To improve heating systems efficiency, ventilation and air conditioning we recommend installing metering consumption machines, the use of solar collectors and heat accumulators, installation contactless taps and cranes, two-key cisterns, water head pressure stabilizers.

In addition, any service business, especially large hotel establishments in the normal course of business generates a huge amount of waste tons, causing great damage to the environment. Particularly acute in large Russian regions there is a question of recycling of solid waste.

In order to minimize the waste of hotel enterprises, the following measures can be implemented:

- install containers for separate garbage collection. To do this hotel rooms must install three types of baskets, one for the collection of paper waste, the second for plastic waste, the third for other types of waste. In hotel guest areas there must be a set of three types of baskets, in addition in the lobby there must be

installed a special container for the collection of used batteries.

- to minimize plastic waste of hygiene products (shampoos, gels) instead of individual packages one must use dispensers;

- refuse to use paper napkins, replacing them with cloth;

- minimize paper promotional products, or use the recycled secondary raw materials;

- the use of rechargeable batteries in the TV and air conditioning control panels;

- refuse to use plastic packaging for gifts and compliments for guests;

- in the administrative services of the hotel to minimize the number and information on paper, use the opportunities of computer technologies, maintaining records in electronic form, without printing;

- minimize packaging material in the procurement of goods, re-packaging and usage;

- improve order planning system, and a system to store and accounting product shelf life in the license mini-bars;

- purchase goods and food from local producers that will allow to reduce transportation costs and to reduce the negative effect from transportation means;

- inform visitors about the environmental practices implemented in the hotels, involve guests in this process. To this end, it is recommended to place informational material in the public areas and hotel rooms, as well as the hotel's website and on the official pages on social networks.

Significant harm to wastewater is caused by the use of household chemicals during cleaning and laundry. In order to reduce the negative effect the following measures can be offered:

- change the linen and towels in the rooms only on request or upon arrival of a new guest;

- use non-toxic household chemicals that have an environmental safety certificate;

- use cleaning tools and materials as needed rather than in the recommended amounts since such recommendations may comprise incorrect information;

– in laundry and dry cleaning to use chemicals effective at low temperatures, install devices for purification of water to ensure reuse.

The implementation of the above activities will not only help to reduce the cost of the enterprise services sector, through the introduction of energy efficient technologies, but also the formation of socially responsible companies image, which ultimately have a positive impact on the services competitiveness.

### CONCLUSION

According to the study results it can be concluded that in recent years the process of environmental technologies implementation in the services area, the emergence of eco-businesses, including ecohotels, meet the needs of present-day modern society in the development sustainable principles implementation, finding balance between economic rationality and concern for the environment.

The main activities for environmental technologies implementation at the service sector can be divided into two groups: an effective waste management (minimization and recycling), and reducing the use of various resources (electricity, water, purchased goods

and products). For each of these groups the authors suggested measures aimed at environmental risks minimization and ensure efficient use of all resources.

During the research, it was found that one of the most pressing problems for the enterprises in the environmental safety services sphere is the lack of an effective monitoring system for the resources consumption and waste management production and consumption. In many enterprises of this sphere, there are no basic elements, principles of environmental management are not implemented.

According to the authors, such a depressing situation is largely related to the fact that the service sector is dominated by small and medium-sized enterprises, which consider the environmental technologies implementation expensive and therefore not the most important business direction. However, the sustainable development concept, spread in society, the ideas of responsible attitude to the environment, now lead to the fact that services consumers at the other approximately equal conditions are beginning to choose those companies that base their activities on the environmental management principles.

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