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GREEN TECHNOLOGIES IN THE FIELD OF TOURISM

Currently, the consumer attitude towards of natural resources are increasingly dominating. Therefore, the introduction of new approaches in various spheres of human activity, including tourism, contributing to an increase in the efficiency of their use, without harming the environment, is necessary for modern society. In this regard, the most relevant is the greening of tourism activities. Ecologization of tourist activity is considered as a complex phenomenon of modern social development, in the process of which there is an interaction of various material and ideological objects and phenomena of natural, social and economic content. Ecologization, as an important part of the “green” economy, is aimed at maintaining the welfare of society through the rational use of natural resources, as well as the return of final products to the production cycle. The article discusses the ways of greening technologies in the field of tourism, the positive and negative impact of tourism on the environment, as well as the consequences of its negative impact, and reveals the principles of greening tourism. At the same time, the theme of the international exhibition held in 2017 in Kazakhstan EXPO “Future energy” – alternative energy sources was analyzed, ideas for implementing the principles of the “green economy” were demonstrated, and technologies presented at the exhibition that promote tourism were highlighted. A sociological survey of the population was conducted on the issues of greening technologies in the field of tourism, and ways of greening the tourist infrastructure were proposed.

Key words: tourism, greening, technologies, EXPO-2017, energy-saving technologies.

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Туризм саласында технологияларды экологияландыру

Қазіргі уақытта табиғи ресурстарға деген тұтынушылық қатынас басым болып келеді. Сондықтан оларды қоршаған ортаға зиян тигізбестен пайдалану тиімділігінің артуына ықпал ететін туризмнің, соның ішінде адам қызметінің әр түрлі салаларына жаңа тәсілдерді енгізу қазіргі қоғам үшін қажет. Осыған байланысты туристік қызметті экологияландыру ең өзекті мәселе болып табылады. Туристік қызметті экологияландыру қазіргі әлеуметтік дамудың күрделі құбылысы ретінде қарастырылады, оны жүзеге асыру барысында табиғи, әлеуметтік және экономикалық мазмұндағы әртүрлі материалдық және идеологиялық нысандар мен құбылыстардың өзара әрекеті жүреді. Экологияландыру, «жасыл» экономиканың маңызды бөлігі ретінде, табиғи ресурстарды ұтымды пайдалану арқылы қоғамның әл-ауқатын сақтауға, сондай-ақ түпкілікті өнімді өндірістік циклға қайтаруға бағытталған.

Мақалада туризмдегі технологияларды экологияландыру жолдары, туризмнің қоршаған ортаға тигізетін жағымды және жағымсыз әсерлері, сондай-ақ оның кері әсерінің салдары қарастырылып, туризмнің экологияландыру қағидалары көрсетілген. Сонымен қатар, 2017 жылы Қазақстанда өткен халықаралық көрменің тақырыбы «ЭКСПО. Болашақ энергиясы» – баламалы энергия көздері талқыланып, «жасыл экономика» қағидаттарын іске асырудың идеялары қарастырылды, туризмді ілгерілетуге ықпал ететін технологиялар көрсетілді. Туризм саласындағы технологияларды экологияландыру мәселелері бойынша халыққа әлеуметтік сауалнама жүргізілді, туристік инфрақұрылымды экологияландыру жолдары ұсынылды.

Түйін сөздер: туризм, жасылдандыру, технологиялар, ЭКСПО-2017, энергия үнемдейтін технологиялар.

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Экологизация технологий в сфере туризма

В настоящее время всё более доминирует потребительское отношение к природным ресурсам. Поэтому внедрение новых подходов в различных сферах человеческой деятельности, в том числе и туристской, способствующих повысить эффективность их использования, не нанося ущерба окружающей среде, является необходимым современным обществу. В связи с этим наиболее актуальным является экологизация туристской деятельности. Экологизация туристской деятельности рассматривается как сложное явление современного общественного развития, в процессе реализации которого происходит взаимодействие разнообразных материально-вещественных и идеологических объектов и явлений естественного, социального и экономического содержания. Экологизация, являясь важной частью «зеленой» экономики, направлена на поддержание благосостояния общества за счет рационального использования природных ресурсов, а также возвращения конечных продуктов в производственный цикл. В статье рассматриваются пути экологизации технологий в сфере туризма, положительное и отрицательное воздействие туризма на окружающую среду, а также последствия его негативного воздействия, раскрываются принципы экологизации туризма. Вместе с тем проанализирована тема международной выставки, проведенной в 2017 году в Казахстане, – «ЭКСПО. Энергия будущего» – альтернативные источники энергии, продемонстрированы идеи воплощения в жизнь принципов «зеленой экономики», освещены, представленные на выставке, технологии, способствующие продвижению туризма. Проведен социологический опрос населения касательно вопросов экологизации технологий в сфере туризма, предложены пути экологизации туристской инфраструктуры.

Ключевые слова: туризм, экологизация, технологии, EXPO-2017, энергосберегающие технологии.

Introduction

The tourism industry, which began in the 1950s, is one of the most dynamically developing sectors of the world economy and has already had its impact on nature. Therefore, the increase in tourist flows and their density in all regions of the world causes serious concern to political figures, representatives of the scientific community and most ordinary people. According to UNWTO formal General-Secretary Taleb Rifai information, 5% of global CO₂ emissions come from tourism, which divided 40% from air transport, 20% from accommodation, and the remaining 40% from transportation, such as ground transport, railways and cruise and health services. Concerned about the future of the tourism industry, tourism organization should concentrate they attention to develop the industry through a green economy (Pecheritsa, 2013).

Tourism is an industry that is closely related to the environment and despite its emphasis on the purity and quality of nature, aims to make extensive use of many natural resources for its development. Therefore, tourism not only has a positive impact on the country's economy, but also has a negative impact on the environment. The negative impact of tourism today occurs in many developing countries, especially in countries that do not have sufficient

technical and financial capacity to replenish the resources consumed by tourists and eliminate the household waste they produce. For example, in Nepal, despite the lack of fuel, active forms of tourism are very popular among tourists, and every tourist who goes for a walk in the country burns about 6 kg of wood per day. In Egypt, only one hotel uses the light, which is consumed by 3,600 ordinary families a year (Pecheritsa, 2013).

In addition to the indisputable advantages of tourism for the region, such as the protection of special protected natural areas, there are several negative effects of its development. The most important negative effects of tourism for the environment and socio-cultural environment are as follows (Property 24; Khrabovchenko, 2013):

Ignoring the recreational capacity of recreation areas, overuse of natural ecosystems due to the simultaneous increase the number of people for that place;

Increase of unauthorized loads on the natural landscape in accordance with the Environmental Code of the Republic of Kazakhstan;

Increased noise caused by an increase in the total number of vehicles;

Increasing anthropogenic pressure, which leads to the loss of historical and architectural heritage, changes in the sectors of the local economy that depend on tourism and affect the emergence of the region.

Table 1 – The positive and negative impact of tourism on the environment (compiled by the authors)

Positive effect	Negative effect
<ul style="list-style-type: none"> – direct financial investments in environmental protection, which come in the form of payment for visits to eco-tourism facilities; – support and development of specially protected natural areas; – reduction of impact on ecosystems (in accordance with environmental standards); – rational use of land; – protection of rare species of ecosystems. 	<ul style="list-style-type: none"> – intensive use of water resources to ensure the direct consumption of hotels, parks, as well as tourists; – degradation and depletion of natural resources as a result of intensive construction of tourism-related facilities: land plots, roads, airports, etc.; – the increase in atmospheric pollution is due to the growth of international tourist flows by various modes of transport;

Tourism is a major carrier of social and environmental changes. The main argument for social changes is the development of international tourism. Because international tourism is considered as a catalyst for the transition of any country from the traditional way of life to modern western forms of society, all its characteristic features. As tourism introduces new trends in the social sphere, it contradicts the traditional norms that exist in society and conflicts with long-standing cultural traditions.

Due to this, tourism is associated with human rights violations, and as a result of its development, there is an increase in crime, prostitution, alcohol and drug use. In addition, according to the International Labour Organization probably from 3 to 19 million children and adolescents work in the tourism sector (Yakovenko, 2015; Yakunin, 2015; Ayuso, 2006).

As for environmental changes, we can note the following changes caused by the negative impact of tourism on the environment:

Table 2 – Changes caused by the negative impact of tourism on the environment (compiled by the authors)

Type of change	Consequences of changes	The type of tourism that leads to change
Changes in geological resources (mountain landscape, minerals and extractable resources)	This is mainly due to changes in the composition of rocks, destruction of stalactites, stalagmites in caves, environmental pollution and the extraction and use of precious stones from fossils for souvenirs.	Speleotourism and mountain climbing.
Changes in the soil.	As a result of the construction of tourist infrastructure (buildings, structures, car parking lots, roads, pedestrian paths), the destruction of the upper fertile soil layer or, as a result, the degradation of vegetation.	All types of tourism.
Changes in water resources (underground water, open reservoirs with fresh water and seawater)	The location of hotels, tourist territories on the banks of lakes and rivers leads to a gradual waterlogging of the territory due to their carelessness and lack of clean water.	Beach tourism, accommodation, catering facilities located along the beach.
Changes in vegetation (forests and their cover)	Trampling of the forest cover by humans leads to degradation, picking plants leads to an increase in the number of weeds that replace it.	Active types of tourism (adventure, sports and etc.)

Currently, the rapid growth of tourism, as we can see above, leads to particularly significant environmental changes. In order to solve environmental problems, the tourism sector should be implemented through environmental protection. The ecologization of tourism includes the following areas: active preservation of Natural Heritage; transition of tourism industry enterprises to the use of resource-saving technologies; improving the

ecological culture of participants in tourist activities. In order to transfer tourism industry enterprises to the use of resource-saving technologies, we need to consider ways to obtain alternative energy sources.

Scientific research methodology

Taking into account the negative impact of tourism on the environment, it is proposed to develop

the industry through environmental protection. The ecologization of tourism is a long-term and step-by-step system and is part of the ecologization of the economy. The initial step of the system will be to fully understand the term and implement it in the industry, as well as the country's environmental policy.

Ecologization of tourism – the transition to the use of environmentally friendly and safe innovative technologies and products in the tourism industry, taking into account the cultural, historical features and traditions of the country. At the same time, the ecologization of tourism should be carried out in the areas of resource-saving technologies in the tourism business, modern technologies for processing and processing waste in the tourism business and the ecologization of transport support in tourism. The main requirements for the ecologization of tourism as an integral part of the ecologization of the economy include the following (Nezdoyminov, 2014; Andrei, 2015):

- the ecologization of tourism should make a significant contribution to the process of protecting, preserving and increasing the natural resources of a particular region;

- in tourist enterprises, environmentally friendly products should be used when serving consumers;

- ecologization of tourism it is necessary to create conditions for the active dissemination of ideas of sustainable economic development, including improving the situation in developing countries, where tourism is the main branch of the national economic system;

- environmental protection should be an integral part of the modern tourism industry;

- the greening of tourism should contribute to the preservation of the ethno-cultural potential of the territory, traditions and beliefs of the local population.

The transition to an environmentally friendly model of production and consumption of tourist products requires, in particular, appropriate conditions and incentives, as well as support from World organizations such as the United Nations, UNWTO and the state organizations. “One of them is that Kazakhstan won the Expo Future Energy Exhibition and, thanks to this exhibition, held the world conference “Tourism and future energy - CO₂ emissions reduction”, which is the main step in support of the greening of Tourism. The future of tourism is inextricably linked with the possibility of introducing alternative energy technologies in the industry and forming sustainable development strategies. Therefore, it is a great responsibility to hold the exhibition of future energy in our country, which

is important for the development of tourism. At the same time, our country is not indifferent to the problems of the modern world, because of its participation in the holding of this exhibition. Thanks to the exhibition EXPO 2017 future energy, our homeland has entered the era of new discoveries and innovative solutions in science and technology. This will lead to a radical change in the nature of economic growth and our way of life.

According to the results of the expo Future Energy Exhibition, 115 countries and 22 international organizations took part in the exhibition and demonstrated their technological achievements in the production of future energy to the entire population. The exhibition contributed to the development of transport infrastructure, the construction of about 10 new hotels and about 20 hostels in Nur-Sultan city. In addition, thanks to the support of our country for sustainable development, we were able to demonstrate the achievements of other countries in sustainable development.

At the same time, the ecologization of tourism is carried out through projects that have emerged thanks to the adopted policy and integration of countries. The Green Arena project, developed between Northern Europe and the north-western territory of Russia, is based on three priority areas:

Tools and strategies for the transition to a “green economy”. This includes the development of strategies for sustainable and green development and territorial branding of the city or district, master plans, the introduction of “green investments” in infrastructure (energy, transport, water supply, etc.), resource-saving technologies in housing construction, creating conditions for modern, environmentally friendly and livable.

Green routes and tourist and recreational potential of the Nordic countries and Russia. “Greenways” is the positioning of cultural and cognitive tourism as an integral part of local sustainable development through a network of green routes of European cultural and natural heritage.

Innovative networks and clusters of “green technologies”. Development of “green technologies” that ensure economic growth, development of cooperation at all levels in all sectors of the country, including industry, science and the public sector, innovation in small business and the promotion of resource conservation and environmental protection, cluster development (Kovalev, 2011; Sharygin, Luchnikov, 2012).

In our opinion, the welfare and prosperity of the country should be at the highest level in order to develop sustainable tourism, create conditions

for the greening of Tourism. It is determined by the British Analytical Center Legatum Institute, which has been operating since 2006. The Center created the world Prosperity Index (Legatum Prosperity Index) between countries. This index is a summary of the countries 1) economy; 2) entrepreneurship; 3) management; 4) education; 5) health care; 6) security; 7) personal freedom; 8) social capital 9) is determined by such indices as the natural environment and places states in certain places. For example, in 2017, Kazakhstan ranked 72nd out of 149 countries, and in 2018, it ranked 73rd. In those years, the country of Russia took 101st and 96th places. And the last place is occupied by 149 Afghanistan. According to the overall results of the world Prosperity Index, the situation of countries is improving, but this trend is not happening in all countries. Therefore, environmental support for the tourism sector is not at the same level in all countries (Ratings legatum prosperity index, 2018).

Scientific works of domestic and foreign authors on the study of Tourism ecologization were consid-

ered, as well as the following research methods were used: the method of analysis of theoretical data, comparative legal and logical methods.

The research is based on the use of scientific methods: generalization from particular to general and from general to particular, analysis, forecasting, environmental assessment (analogy).

In the course of writing the article, various sources of literature were used: scientific literature, analytical materials, etc.

Results and discussions

The goal of using “green technologies” and the goal of Greening – to find the most cost-effective solutions that reduce the impact of production growth, ensuring the use of the environment and efficient use of resources (*about Project, 2013*).

To do this, first of all, it is necessary to determine the directions and ways of their implementation, which are suitable for use in accommodation, food, transport basic services and additional services that make up the tourist infrastructure.

Table 3 – Ways to ecologize tourist infrastructure services. (The tourism sector of the German economy feels comfortable, 2013; Environmental certification in tourism as a tool for quality assurance and effective marketing, 2013; Microsoft and the world tourism organization will encourage innovation in the tourism sector, 2012)

Tourist infrastructure services	Ways of greening	Forms of implementation
Accommodation	Use of resource-saving technologies	– automatic lighting control; – automatic heat supply regulation; – operation of a solar power plant (photovoltaic panels); – solar panels installed on the roof to heat water; – wind generators for generating electricity.
	Use of modern waste treatment technologies	– Sorting waste according to the international standard into 4 special categories: paper waste, glass products, plastic products and metal; – transfer of garbage by plasma gasification to garbage cleaning and recycling plants.
	Use of modern processing technologies	– window glass made of recycled materials; – use of non-toxic paints in interior decoration; – furniture made of recycled materials.
Catering	Use of eco-goods and food	– purchase of organic food and consumer goods; – boycott and refusal to consume goods on the part of producers who violate the norms of environmental legislation.
	Use of modern processing technologies	– use natural packaging materials that can be recycled or safely recycled later.
Transport services	Greening of transport	– equipment for reducing CO2 emissions in air, surface, and water transport; – driving with diesel fuel and electric motors; – hybrid cars, electric vehicles; – organize access to nearby places by bicycle and horse-drawn carts.
	Greening of road networks	– installation of environmental structures on transport road junctions; – provision of equipment for alternative modes of transport from environmentally friendly products.

In order to use the above-mentioned technologies in tourist services, any recreation area that provides for sustainable development should strive to solve 4 problems:

Reducing greenhouse gas emissions, especially carbon dioxide.

The Fairmont Waterfront Hotel, located in Vancouver, Canada, uses a heat reuse system to reduce carbon and heat emissions: the system captures condensate from the hot water reservoir and returns it to the water entering the pipes and heats it in this way. This technology saves 305 thousand kilowatt-hours of electricity per year, which is equivalent to the annual energy consumption of seven private homes.

Conservation of biodiversity.

If environmental measures were not taken in time, international tourism has already had a negative impact on the flora and fauna. For example, an unregulated flow of travelers to desert areas is observed on the Caribbean islands and swamps of New Zealand and continues to disrupt the feeding system and nesting sites of chicks there.

Waste recycling.

As one of the main pollutants of nature, the tourism industry should have its own impact on waste production, as waste reduces the quality of water and soil and reduces the attractiveness of recreational areas. In recent decades, waste from a large influx of tourists to Venice has led to pollution of the city's canals and floods. Therefore, tourist centers should pay special attention to proper waste management.

Protection of water systems.

Providing high-quality water is very important for the long-term environmental sustainability of any resort. Water scarcity is observed in many regions of the world. Two main factors - population growth and the consequences of climate change - are causing concern due to the lack of this important vital resource.

All the above elements of environmental protection are interrelated. Poor waste management can lead to the release of harmful gases and contamination of water supply, and both of these factors can pose a threat to biodiversity (Tourism investing in energy and resource efficiency, 2015; Ruban, 2016; Modern tourists choose ecological vacations, 2013).

The introduction of energy-saving technologies will be the second step for any industry, if the above-mentioned issues will be solved first of all.

And the Expo of the Future Energy Exhibition in Nur-Sultan will serve as a guide to the optimal

solution for the use of "green technologies". Because during this exhibition, each country had the opportunity to use the technology they need, and there was an exchange of experiences between countries.

The transition to the greening of tourism will reach a certain level, i.e. the initial level, when the following works are carried out:

Any country should participate in exhibitions and events dedicated to the concept of sustainable development and participate in their organization;

Demonstration of the country's advanced technologies at exhibitions, exchange of experience with other countries;

Develop a policy of Environmental Protection of Tourism and contribute to the implementation of this policy, using the knowledge gained at exhibitions;

Monitor and assess the environmental situation of your country and determine which parts of the industry are most affected;

Conduct work on familiarizing and popularizing the local population with the current environmental situation, conduct frequent surveys and improve their environmental knowledge.

A survey was conducted to familiarize the local population with the current environmental situation and to conduct propaganda work. This survey showed that the local population of the country is able to understand the environmental impact of the tourism industry and the impact of the industry on nature. It was also determined that it is necessary to work with the population (Karpova, 2015; Ruban, 2014; Печерица, 2013).

According to the survey, 1000 respondents answered for 12 questions. Of these, 57.1% were male and 42.9% were women citizens. As for the age of the respondents, the respondents were 9.5% under the age of 20, adults between the ages of 21 and 35 answered 70% , 19% between the ages of 36 and 50, and elderly people over the age of 51 answered 1.4%.

As a result of the above survey, everyone realized that in the first case there are existing environmental problems and they need to be dealt with. At the same time, 95.2% of the local population confirmed that it is their duty to keep the environment clean, and the tourism sector should also provide assistance in Environmental Protection, which should be carried out by investing 33.3% in environmental activities, 33.3% in the restoration of natural monuments, 23.8% in the protection of wild animals and 9.5% in forest planting. And the role of Expo in the greening of tourism in the Future Energy Exhibition was answered as follows:

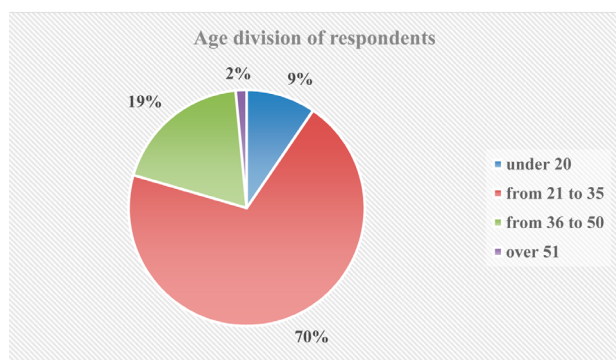


Figure 1 – Age indicators of respondents who took part in the survey (compiled by the authors)

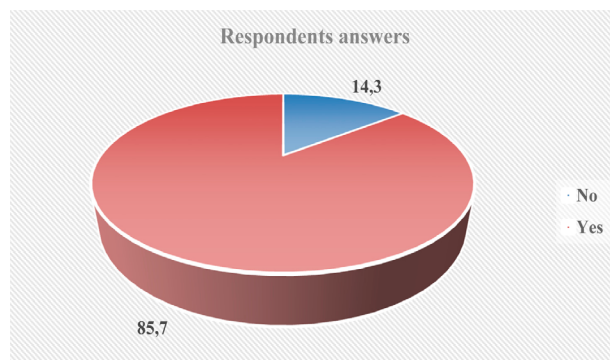


Figure 2 – Opinion of respondents on the need to apply an environmental rating in accommodation (compiled by the authors)

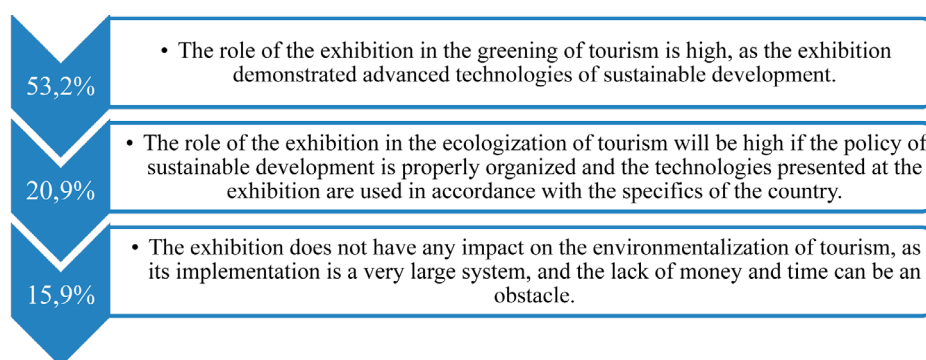


Figure 3 – The role of Expo-2017 "Future energy" in the greening of Tourism (compiled by the authors)

According to the above-mentioned survey, the local population has proved that today it is necessary to take steps through technologies that have a small impact on the environment, each developing industry, including tourism, should develop through environmental protection, and the expo-Future Energy Exhibition in our country will help to use resource-saving technologies that do not have a negative impact on nature in the field of tourism (Karpova, 2005; World Tourism Organization, 2018; Penetier, 2013).

Conclusion

In conclusion, since the deterioration of the environment has become a problem not only in the country, but also in all countries of the world, the following negative effects on the environment of the tourism industry, which has become a phenomenon of the XXI century, were identified: neglect of the recreational capacity of recreation areas; increased atmospheric pollution caused by an increase in the number of vehicles; increased anthropogenic

pressure, which leads to the loss of historical and architectural heritage.

At the same time, the optimal solution to these problems will be environmental protection. The ecologization of tourism should be carried out through certain stages. One of them will be the vision of advanced technologies through exhibitions, fairs, events and the rational use of technologies depending on the geographical, economic and environmental situation of the country. To do this, it is necessary to start with a simple receipt of energy, if each state has the opportunity. For example, "windmills" can be installed at the Dzungarian gate (near the Kazakh-Chinese border), which is located in the east of Kazakhstan, because there is a strong wind here, which is the beginning of resource saving. This does not mean that the country does not have energy-saving technologies. For example, the following system has been installed in Nur-Sultan: one of the innovations called Smart Flower is a self-regulating system that converts solar rays into electricity. In addition, solar panels will be used to charge bus stops, traffic lights, high-speed car seats,

appliances, street lighting and power lamps in parks and squares.

The immediate introduction of tourism environmental technologies into our daily lives is becoming a big problem, especially for developing countries. Because the introduction and use of these technologies requires knowledge and funds, as well as the presence of environmental knowledge

in the minds of the local population. The solution of this problem should be carried out in developing countries with a certain system (preparation of an ecosystem, ecological education of the population, membership in promotion Associations, participation in exhibitions, exchange of experience) and begin with the introduction of the simplest energy-saving technologies into production.

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