The green agenda influence on the methodology of housing and communal services pricing

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Abstract. The paper proves the necessity of revising the methodology of housing and communal services pricing in connection with the implementation of the city development concept within the framework of the green agenda and the strategies and programs development aimed at ecologically important problems resolution, clean technologies development, natural resource conservation, and the increase in the population living standards as well. It is shown that the creation of ecologically sustainable urban systems requires not only the development and implementation of innovative technologies and attraction of financial resources but also the assessment of their consequences, such as changes in the volumes of consumed housing and communal services and tariffs for them. Adjustments to the methodology of housing and communal services pricing should ensure the process of providing quality services at affordable prices for consumers. The main results of the study demonstrate that modern cities should utilize innovative solutions aimed at changing the approach to operating and managing housing and communal services to meet the requirements of ecological safety and sustainability. Implementing the recommendations to improve the ecological situation and sustainability of housing and communal services can become a key factor in creating a peaceful, successful, and efficient urban environment.

Keywords: ecological safety, urban development, housing and communal services, resources, tariff regulation, energy conservation.

1 Introduction

In accordance with the Environmental Doctrine of the Russian Federation approved by the Decree of the Government of the Russian Federation No. 1225-r dated August 31, 2002, and other legal acts of the Russian Federation regulating activities in the field of ecology, sustainable further development of this country, improvement of the population life quality, and national security can be ensured by preserving and maintaining natural systems and the environment. In this regard, an ecological policy aimed at the sustainable and careful use of

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the country's natural resources and the protection of the environment is consistently being implemented at the state level. Currently, the issues of preserving and restoring natural systems are one of the most important directions of activity in this country at both the state and societal level [1-3].

The green agenda is a concept of sustainable country development that aims to preserve and restore the ecological balance and natural resources while meeting the society's needs in economic development. One of the main objectives of the green agenda is to reduce the emissions of harmful substances into the atmosphere, conserve energy and other resources, and create a favorable environment for people's lives and prosperity. In this regard, the green agenda stimulates the development of technologies and services that promote energy efficiency, reduce the use of hydrocarbons, and decrease environmental pollution level, etc. Overall, it encourages a change in consumer and behavioral patterns.

Within this concept, strategies and programs aimed at environmental research and development, resource conservation, and the population living standards improvement are being developed in cities. The implementation of these programs contributes to the development of infrastructure and services related to environmentally clean energy, the creation of environmental areas and parks, and a favorable living environment for city residents.

All these factors affect the need to revise and adjust financing of these activities, identify sources of investment into environmentally significant projects, and assess the financial consequences of their implementation, including the ones for consumers of housing and communal services, especially the population [4, 5].

In addition, the implementation of the green agenda concept has a direct impact on the methodology of housing and communal services pricing in cities. Changes in people's behavioral patterns aimed at saving resources and increasing their efficiency lead to changes in the volume and quality of housing and communal services provided. The expenses for ecological technologies and measures aimed at reducing the negative impact on the environment will be taken into account when determining the cost of housing and communal services for consumers. They must be included in the calculation of tariffs for housing and communal services.

The basics of pricing methodology of housing and communal services are regulated by the legislation of the Russian Federation [6, 7]. The methodology of housing and communal services pricing in cities is based on the cost of expenses related to the provision of these services. This includes expenses for payment of infrastructure servicing employees labor, compensation of expenses for maintenance and repair of buildings, execution of repair works on water supply and sewerage networks, expenses for transportation of household waste, etc. Regulatory authorities may audit, inspect, and analyze accounts of housing and communal services enterprises to ensure that services are provided at affordable prices and meet established quality standards.

2 Materials and Methods

Under the influence of the green agenda program, new standards, tasks, and measures for improving ecological safety and efficient use of natural resources are being introduced. Hence, the methodology of pricing communal services will require some changes to be made. Prospects for changes in the methodology of housing and communal services pricing may include:

1. The increased use of economic incentives.
2. Accounting for the use of innovative technologies.
3. Accounting for the ecological component.
4. Optimization of natural resource use and cost reduction.

The increased use of economic incentives. Due to the continued influence of the green agenda, it may be possible to expand the use of economic incentives aimed at increasing the efficiency of natural resource use and reducing negative impact on the environment. This may include differentiated tariffs for housing and communal services depending on the level of ecological safety and efficiency of resource use.

Accounting for the use of innovative technologies. The introduction of innovative technologies can lead to increased efficiency of natural resource use and reduction of environmental impact. In connection with the continued influence of the green agenda, the methodology of pricing may be changed in accordance with this development. For example, the costs of innovative technologies introduction may be taken into account when setting the prices of communal services.

Accounting for ecological component. As earlier, the ecological component can be taken into account in communal services pricing. In connection with the continued influence of the green agenda, pricing standards may be directed at increasing the percentage of energy-saving solutions and eco-friendly technologies, while the older and less efficient methods of natural resource use may be limited.

Optimization of natural resource use and cost reduction. In order to increase ecological safety and improve the quality of services, additional efforts may be taken to reduce waste disposal costs, improve water supply and sewerage networks, etc. The changed methodology of pricing will reflect these changes and encourage their stimulation.

Thus, changes in the methodology of pricing in connection with the continued influence of the green agenda may lead to the expansion of the economic incentives use, the use of innovative technologies use, the consideration of ecological component, further reduction of waste disposal costs, improvement of water supply quality, etc. Overall, the effectiveness and sustainability of housing and communal services will continue to depend on complex solutions related to ecological safety and economic conditions.

3 Results and discussion

One of the most important components of the development process is currently the possible transition of the energy sector from natural resources (fossil fuels) to renewable (alternative or green) sources such as wind, solar, atomic energy, etc. It is expected that, taking into account various factors, in the Russian climate changes may be more noticeable than in some other countries [8].

For example, according to the Ministry of Energy of the Russian Federation, the share of rain-power and wind-power plants in the United Energy Systems of the Russian Federation has significantly increased from 2015 to 2021. At the same time, energy resource consumption patterns have practically not changed from 2012 to 2020, and the amount of losses at the consumption stage in the Russian Federation has even decreased [9].

The spatial distribution and generating capacities structure of the power industry should, on the one hand, meet environmental requirements, and on the other hand, be aimed at ensuring the efficiency and reliability of the electricity supply process for consumers, including the population, at reasonable and affordable prices for electricity and power [10]. The methodology of electricity pricing in the Russian Federation is regulated by the state [11, 12].
In the field of waste disposal, all waste can be divided into industrial waste and municipal waste. Industrial waste accounts for the majority (from 97 to 98%), and municipal solid waste (MCW), agriculture and transport waste consist the remaining 2-3% [13].

Studies by various authors focus on addressing the problems related to pollution of the environment by MCW in cities. These studies explore different ways of managing MCW in countries around the world and compare existing waste management methods in different countries, including Russia. There are ecological and economic factors that should be considered when finding solutions to these problems. Currently, there are a number of factors restraining the deterioration of the environmental situation and promoting the development of advanced technologies for minimizing the harmful effects of MCW on the environment [14].

Recently, the Ministry of Energy in Russia has initiated the creation of a new direction in energy sector based on the use of MCW. This involves stimulating the process of building incineration plants, including the construction of high-tech energy generating facilities that turn 240,000 tons of waste per year into energy, which is comparable to the amount of waste produced by half a million people [15].

All of these factors affect the need to review and adjust the financing of these activities, determine sources of investment in environmentally significant projects, and evaluate the financial consequences of their implementation, including the ones for consumers of housing and communal services, especially for the population [16, 17].

In addition, the implementation of the green agenda directly affects the methodology of housing and communal services pricing in cities. A change in people's behavioral patterns towards resources conservation and increased efficiency of their usage leads to a change in the volume and quality of housing and communal services provided.

Expenses on environmental technologies and measures aimed at reducing the negative impact on the environment will be taken into account when determining the cost of housing and communal services for consumers and, thus, should be included in the calculation of tariffs for housing and utilities services [18].

The methodology of housing and communal services pricing in cities is based on the cost of provision of these services. This includes expenses for payment of infrastructure servicing employees labor, compensation of expenses for maintenance and repair of buildings, execution of repair works on water supply and sewerage networks, expenses for transportation of household waste, etc. [19, 20].

Public administration in the field of electric power, heat engineering, gas and water supply, water disposal, and MCW is carried out with the aim of providing not only sustainable development and reliable functioning of these economy sectors but also social stability of society, as well as energy and environmental security of the country.

The implementation of the green agenda determines a number of changes in people's behavior and consumption aimed at increasing the efficiency of resource use and environmental responsibility, which are presented in Table 1.

**Table 1.** Key changes in people's behavior and consumption resulting from the implementation of the green agenda concept
Factors restraining the deterioration of the environmental situation and promoting the environment [14] are considered when the impact on the environment will be taken into account when determining the cost of housing and communal services for consumers and, thus, should be included in the calculation of housing and communal services, especially for the population [16, 17].

The stability of society, as well as energy and environmental security of the country, affect the volume and quality of housing and communal services provided.

In countries, including Russia, there are ecological and economic factors that should be towards resources conservation and increased efficiency of their usage leads to a change in life becomes increasingly relevant.

The implementation of the green agenda determines a number of changes in people's behavior and consumption resulting from the implementation of environmental protection measures. It is also necessary to take into account the need to review and adjust the pricing standards for housing and communal services sector. On the other hand, these activities should be done to improve the quality of housing and communal services and to avoid a significant increase in their cost for consumers, especially for the population.

Overall, analyzing Table 1, we can conclude that the implementation of the green agenda leads to changes in people's behavior and consumption towards more environmentally conscious, sustainable, and responsible actions. Furthermore, it affects the volume and quality of housing and communal services in cities.

Since the green agenda is a comprehensive program aimed at building a green economy and ensuring environmental sustainability, it is necessary to plan and implement measures in cities aimed at eliminating negative environmental impact, especially in the housing and communal services sector. On the other hand, these activities should be done to improve the quality of housing and communal services and to avoid a significant increase in their cost for consumers, especially for the population.

One of the main goals of the green agenda is to reduce the impact of housing and communal services on the environment. Measures are taken as part of this program to save resources, use energy-saving technologies, improve water supply quality, introduce measures aimed at increasing waste disposal, etc. It is also necessary to take into account the costs of reducing the negative environmental impact. At the same time, the cost of services may increase to cover the cost of implementing environmental protection measures and technologies.

To promote the efficient natural resource use, measures to introduce economic incentives are taken. For example, the introduction of differentiated tariffs for communal services depending on the geographic location of the houses and categories of population leads to a cost reduction and an increase in the quality of housing and communal services.

Housing and communal services pricing standards should also be aimed at ensuring compliance with corresponding environmental standards. Introducing an environmental component into the cost of housing and communal services can lead to a reduction in the volume of consumed resources, increased efficiency, and improved quality of services.

Active public policies should also be directed towards the implementation of the green agenda, especially at the regional and municipal levels. It can include support of new environmental technologies, differentiated tariffs, environmental standards, and control measures to reduce the impact on the environment.
The effectiveness of the revised pricing methodology after the implementation of the green agenda can be evaluated by a number of indicators. Let us consider some of them.

The ratio of the cost of implementing nature protection measures and the level of ecological safety. The ratio of the cost of implementing nature protection measures and the level of ecological safety is one of the indicators of the effectiveness of the revised pricing methodology of housing and communal services. If the cost of implementing nature protection measures is high and the level of ecological safety does not improve correspondingly, then it indicates the inefficiency of the revised pricing methodology.

The level of public satisfaction. The level of public satisfaction with housing and communal services is an important indicator of the effectiveness of the revised pricing methodology. If the level of public satisfaction with housing and communal services improves after the implementation of the green agenda, it indicates a positive dynamics in the work.

The level of resources consumption. If the level of resources consumption in the provision of housing and communal services decreases as a result of the implementation of the green agenda, it indicates that the pricing methodology effectively takes into account the cost of environmental protection measures and stimulates the use of energy-saving technologies.

The level of monitoring and supervision. The assessment of the revised pricing methodology effectiveness should also include the level of monitoring and supervision in housing and communal services. If the number of violations of the rules for the service provision related to the environmental aspect decreases, it indicates that the introduction of an ecological component into pricing leads to an improvement in the quality of housing and communal services.

4 Conclusion

Adopting a comprehensive approach and using new technologies in various sectors of housing and communal services will help cities maintain ecological safety and sustainability of housing and communal services. Modern cities should rely on innovative solutions aimed at improving ecological safety and sustainability of service provision.

The housing and communal services sector includes many industries and enterprises, various consumer groups, and all of them must be oriented towards energy conservation and careful natural resource use, which requires changing the methodology of housing and communal services pricing and implementing economic incentives, as well as taking into account the environmental component when considering proposals for the housing and communal services sector.

The paper presents the main challenges related to energy efficiency, ecological safety, and sustainability in urban housing and communal services. It also emphasizes the importance of ecological safety and sustainability in urban housing and communal services, as well as the need to use modern methods and technologies to achieve them.

The practical recommendations discussed in the paper can serve as the basis for creating more sustainable urban systems where residents can be comfortable and safe. In practice, education, public engagement, and consolidation among municipal authorities, expert communities, businesses, and the population are key factors for achieving these goals, not just attracting investment and developing new technologies.

With the continued influence of the green agenda, changes in the methodology of housing and communal services pricing will remain an important area of activity in the housing and communal services sector. New standards, tasks, and measures aimed at increasing ecological safety and the efficient use of natural resources are introduced under
the program, and this will affect the volumes of consumption of housing and communal services.

The effectiveness of the revised pricing methodology can be evaluated by a number of indicators, such as the cost of the implementation of environmental protection measures, the level of public satisfaction, the level of resources consumption, and the level of monitoring and supervision. All in all, the effectiveness of the revised pricing methodology can be determined by improving ecological safety, increasing the quality of services, and satisfying the population.

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