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INNOVATIVE TECHNOLOGIES AND SOLUTIONS IN THE URBAN ECONOMY OF THE REGIONS

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Abstract

Climate change, population aging, globalization, urbanization, digitalization set new trends for increasing the competitiveness of the national economy through modernization of housing and communal services in the cities in the format of the “smart city” concept. However, this cannot be done without solving the problem of the state entire economic growth. Ensuring the renewal of the urban economy is possible only with qualitative changes in the industry. Modernization of urban economy will allow solving a key problem - the construction of “smart cities”. The purpose of this study is to reveal the potential of modernization of housing and communal services based on innovative solutions in Russian cities. The article briefly discloses the theoretical aspects of the modernization of construction and housing and communal services in Russian cities, provides a rationale for the benefits of innovative solutions in construction and utilities. The main result of the study: the proposed point reform of the housing and communal services of the territory should be carried out comprehensively with other activities that contribute to the sustainable development of the selected district or city. Before the events, a prognostic assessment of a very specific economic effect is given.

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1. Introduction

Analyzing the activity of housing and communal services, the authors invariably operate with such concepts as crisis of engineering infrastructure; high depreciation of fixed assets; huge debt of municipal enterprises; ineffective property management; low quality of utilities and high tariffs for payment. Currently, the housing and communal sector provides 7.6% of added value, 9% of employed population accumulates in the economy and 33% of fixed assets (Chernyshchev, 2007, p. 7). At the same time, studies show that the development of this highly capitalized sphere of activity, firstly, depends on internal economic factors, and secondly, on the formation of market relations in it.

2. Problem Statement

The formation of market relations is relevant to the innovation system of Russia. One of the main problems is its immunity to market relations, inability to promote the final product - goods (service), in the market. Commercialization of innovations, their diffusion - these are elements of innovation and investment activity, which are still underdeveloped in Russia. This problem implies the lack of a methodology for assessing the effectiveness and commercial success of an innovative activity. Also, this problem is in the housing and communal complex, where innovative processes are especially capital intensive. When most communal enterprises do not have their own funds for innovation investment, it is necessary to consider the innovative activity as the implementation of investment innovation projects in conditions of effective investment, that will stimulate outside investors to invest in innovative projects.

The relevance of the research topic is the reform and development of the housing sector among the most important areas of socio-economic transformations in the country, which creates the necessary conditions for human life. The leading industries in this area are housing construction and housing, which ensure the reproduction and maintenance of the housing stock, as well as bringing housing and communal services to direct consumers.

3. Research Questions

In Russia, the level of housing development does not match the requirements; the tasks are not being fully determined, that significantly affects the decline in the quality of life of the population. In this regard, the reform of housing and communal services is becoming one of the most acute economic and social problems of modern Russia. The reason is that it has been going on for more than twenty years and has not brought any significant results, except for the continuous increase in tariffs for housing and communal services, in the opinion of the majority of the population. Therefore, housing and communal services reform and related processes are a constant source of social tension in society. During the implementation of the reform, a contradiction between the goals of the reform and the social consequences that it causes is very clearly manifested. The actual state of household infrastructure is catastrophically deteriorating, the life support system of the population is being destroyed, and it is becoming increasingly obvious that it is very problematic to solve this macroeconomic problem by simply switching to 100% payment of housing and communal services by the population.

Thus, there are prerequisites for a joint solution to the problem of commercialization of innovations and increase the efficiency of the housing and communal service function. This process is complicated. Difficulties are caused by the almost complete absence of a methodology of regional self-government in the innovation process, the insufficient preparedness of regional authorities to actually implement the planned measures and the unreliability of the results of their implementation, the lack of an information base on the problems of the development of the region, the lack of “transparency” and the extreme corruption of the activities of the regional housing and communal service authority. At the same time, at the level of a separate region (for example, the Volgograd region), in the course of improving the activity of the housing and communal complex, specific factors inherent in large cities, such as significant financial resources of the region; the availability of qualified personnel; the possibility of working out standard solutions at experimental facilities for their subsequent replication throughout the country must be taken into account.

The strategic nature of the innovative processes of housing and communal services management is also obvious, which also requires special tools and interconnection at various levels of management.

4. Purpose of the Study

The purpose of this study is to solve a significant national economic problem related to the development of the theory, the system of specific methods and techniques for managing the innovation and investment activity of the housing and communal complex in the region, and to increase the efficiency of reforming the functioning of the housing and communal services, both of a separate subject of management and of the region.

5. Research Methods

Successful implementation of the housing and communal services transformation program, its modernization require significant funds and innovative engineering solutions. The industrial and technical aspects of public policy have priority importance. The essence of industrial policy is the attraction of material, technological, financial and other resources to the industry. The focused technical, and, in particular, urban planning policy has no less importance. In relation to the existing housing stock, it is its modernization, extension of the service life. With regard to new construction – there are increasing the strength and reliability of building materials, the widespread introduction of resource-saving heating systems for residential buildings, etc.

It relates to the sphere of housing and communal services. Here new companies are created, mergers and acquisitions are underway, assets are bought and sold, etc. The interest of private investors in this sector is due to the fact that in recent years, housing and communal services enterprises have almost gone bankrupt, although the population pays almost 100% of the communal services. The first circumstance indicates that housing and communal services enterprises can be purchased for nothing or taken away for debts, the second means breakeven of entrepreneurial activity in this area (Varnavskii, 2007, p. 30). The housing construction sector is no less attractive for investment, whose products are not getting cheaper and are always in demand. Investing in housing construction includes various components: instruments and technologies of accumulation, financial sources, mortgage lending, issuing

institutions, etc (Isaev, 2018; Kozlova & Glushkov, 2006, p. 106). Investments, in essence, are a link (Cardenas et al., 2015) between all participants in the construction of housing and its subsequent operation. However, how to attract investors to the network badly in need of investment network of the Russian economy? And how to introduce relevant, innovative, resource-saving products into the housing and communal services?

For the formation of a workable and highly efficient housing and communal services industry, a process of consistent and systemic change in the model of managing the regional economy is necessary. In the authors' opinion, it is necessary to use the best practices in the reform of housing and communal services in developed countries. Then the scientific novelty of the proposed reform model will consist in its locality, precision, and also in identifying the need for the formation of an industry innovative order. To create a regional innovation economy, one of the main customers and the field of application of innovations should be the regional housing and communal complex. Since the most important goal of reforming the housing and utilities sector is the economy of the industry, reduction of resource consumption and increase of resource output, the introduction of the latest developments in this industry seems to the authors to be especially relevant.

6. Findings

6.1. The first part of the study results

So, a serious obstacle for introducing innovations in such demanded sector as housing and communal services are:

- rising tariffs with falling quality of services;
- lack of control of performers;
- the level of expansion of the public sector in the housing and communal services market.

In the regions, housing and communal services enterprises must be managed by private owners: 40% of enterprises must be privatized, and the remaining ones must be transferred to concession. First of all, we are talking about service providers, water, electricity and heat supply companies like a water utility or a thermal power plant. In this case, the enterprises will not be sold to a private owner, but they will be transferred for use with the opportunity to make a profit in exchange for investments, which should be aimed at modernizing enterprises and reconstructing worn out networks. It is proposed to do this by 2020 using competitive procedures. Such examples already exist. For example, the Volgograd water utility was transferred to a concession by a private company, which should invest 58 billion rubles in it. In total, 1831 concession agreements with investment obligations in the amount of 257 billion rubles were signed in Russia in the housing sector. But the result is not visible...

The housing and communal services market increased from 1.5 to 2.4 trillion rubles from 2012 to 2016 including due to an increase in tariffs for housing and communal services. The annual growth of this market is forecasted at 4-6% per year, only low real incomes of citizens, leading to a rapid increase in debt, can slow down these rates. On average, people spend on housing and communal services 27.5% of all expenses for paid services for the population. And this is a very significant item in the budget of each family - 43% of Russian families have difficulty paying utility bills due to lack of money.

There are many problems, but can privatization and concession solve everything? This is not yet obvious. The situation with the deterioration of networks has developed simply disastrous. According to some estimates, the wear of the utility system is 60–80%. The most critical situation in the water supply and sanitation system. There were 74.5 thousand accidents in Russia, in 2016 on the water supply system. On average, there are 1.8–2.4 accidents for 1km in Russia per year depending on the region, and in Europe, for example, there are only 0.15–0.2 accidents for 1km per year. The difference is more than ten times!

The state faced the need for a serious modernization of networks in the absence of funds for the introduction of modern digital technologies. And, the state decided to get rid of the burdensome sector of the economy not wanting (or not being able) to control the unprecedented theft in this area. Potential investors, however, have already warned that they are not considering the housing sector, especially in the format of concessions, as a successful project for investing money. Businesses are interested in what position the state intends to take: playing with the population and controlling tariffs or a complete transition to economically justified tariffs with the costs of modernization and profit of entrepreneurs inherent in them? According to experts, some tariffs are now underestimated by at least 1.5 times. This once again confirms that the state intends to relieve itself of social responsibility for the housing and communal services sector, which is collapsing before our eyes.

Until now, the government has had one tool to solve the problems of housing and communal services - increase in tariffs. But without reference to quality control and without serious investment in modernization, an increase in the amount of payments that Russians receive only increases social tension, without essentially solving the housing and communal services problems. To maintain the infrastructure in good condition, it is necessary to invest about 500 billion rubles in it annually for approximately five years. Every year, at least 6% of networks need updating, but no more than 2% is actually updated. That is, repairs are underway, and there are only more problems. For example, in Novosibirsk last year, authorities announced a tariff increase of 15% immediately. But even with such an incredible jump in prices, repair costs could be increased by only 22%: from 3 billion rubles to 3.66 billion. There can be no talk of any threefold increase in repair volumes. After numerous rallies of city residents, the increase managed to change to 4%.

The idea of privatizing the housing sector was already discussed in 2011, but then the authorities abandoned it, fearing social unrest after bankruptcies or inefficient work of private owners of housing and communal services enterprises. Indeed, there is no guarantee that a private company will not stop providing houses with heat, water and electricity, or hire an army of collectors who extort debts from poor pensioners. In general, privatization is a good thing, but strategically important facilities should remain under state control. And without transferring to private ownership of this sphere as a whole, you can find ways to find the necessary funds for network modernization (Maksimchuk & Pershina, 2017).

Firstly, it is necessary to conduct a full audit of finances aimed at reducing debt at all levels (debts occur not only with the population, but also with the same thermal power plants that buy gas) and to avoid the recurrence of such situations. Bad debts must be written off and tariff changes balanced and agreed upon. After all, if the price of gas rises by 15% per year, and heat energy by 5%, then the heat supply organization simply does not have enough money to pay for gas. Subsidizing the installation of

meters can help to reduce the costs of the poor. Without this, there is a vicious circle: the lack of funds for installing meters leads to large bills that cannot be paid, and so on in the chain.

6.2. Secondly, the most radical and effective method:

To direct part of our gold and foreign exchange reserves to the total reconstruction of water pipelines, heating mains and power lines. After all, \$ 266 billion is now invested by the state in American and European debt securities. This money may be lost to us with the increasing pressure on Russia. So, is it more efficient to invest money in the Russian economy and, in particular, in the modernization of public utilities? Investments will pay off handsomely. Now the losses of communal resources are very large: in water supply they make up about 30%, in electricity supply - 15%, in heat supply - up to 40%. Money simply disappears. In addition, the big potential lies in the gasification of the country. While everyone is worrying about what Gazprom will do without deliveries to Europe, in our country a significant part of the country does not imagine that main gas can be brought into the house. Firewood, coal and fuel oils are the main sources of energy for Zabaikale and Dalnii Vostok. Investing in the gasification of one's own country will both reduce dependence on export supplies and improve the quality of life of people. The second part of the study results

In a situation where there is practically no competition in the country's economy and the main figure is not an entrepreneur, but an official, it is difficult for an innovative economy to survive. Therefore, it is more correct to think about how to make **the reform of the housing and communal services, possibly in a single territory**, an island of a new economy, which would give impetus to long-overdue changes. What should we proceed from?

The government does not intend to abandon state dominance over the economy. Therefore, there will be no competing businesses in the country that will compete for innovative solutions. At the same time, the authorities did not focus on the "new industrialization" - therefore, in the near future there will be no industrial sector in Russia that could implant new technologies into mass production. There is no breakthrough strategy for world markets, which means that external competition will not create a new motivational mechanism. All this means that Russia will not go either through the United States, which relied on natural competition in the domestic market, nor through South Korea or Brazil, who actively "invested" in industrialization in many sectors, or through Japan, which sought to become an export-oriented economy while maintaining a high level of monopoly inside the country. What, then, can give impetus to innovative development? Apparently, only one thing: **the "point" demand** stimulated by the state.

Within the framework of this strategy, the territory, which should be innovative, modern development, should become a link in a single innovation - production chain. While this "zone of freedom" will be built, the state needs to determine development priorities. Among them, there is already energy conservation and the creation of alternative energy sources; development of new communication systems; pharmaceuticals and medical technology. The development of new building materials, transportation technologies, energy storage facilities, etc. should be added to this list. When priorities are set, the authorities must decide how much money they are willing to allocate for the purchase of the

corresponding products, on subsidies to their producers, or how tough they are ready to set standards that require entrepreneurs to use them.

Under such conditions, two centers of manifestation of initiative will arise. Firms and teams, which are ready to offer innovative solutions, will stretch to the territory where they can hope for a preferential tax and organizational regime. Intermediaries and venture funds that are ready to finance research and pilot production in minimal volumes will also rush here. State assistance, in this case, should be expressed in providing cheap rent, good infrastructure and a high degree of freedom. Industrialists seeking to participate in the production of innovative products will present demand for new technologies and will contribute to their commercialization. The state will guarantee the inviolability of the intellectual property of the former and the profitability of the latter.

It may seem that this goal is not ambitious enough. “Any effective innovation is surprisingly simple; if it is not simple in nature, it will not work” (Druker, 2001, p. 41). The reform point in the housing and communal services (or the reform territory) should become a place of “propagation” of simple solutions that will certainly be in demand. If this minimum program is implemented, it will confirm that in the future such a “reform point” will be able to become an innovation and implementation center of the all-Russian level.

The formation of a new economy in our country is a very long process, and there is no need to count on speedy success in this matter. Innovation - and this is recognized by the authorities themselves - goes poorly with the realities of Russia, which is entangled in bureaucratic snares. Therefore, a point-wise reform of the human living environment, which is housing and communal services, will not make a revolution. But it can - and should - become the first link in a long chain of measures that can make Russia a modern highly developed industrial country (Maznitsa, 2011, p. 78).

6.3. The third part of the study results

Organizing a local change in the work of the housing and communal services on the basis of innovative solutions in a single territory (Maznitsa, 2011, p. 104), we must provide a system of indicators that allow us to carry out a prognostic specific assessment of planned reforms. Indicators should be numerically measurable, recalculated, measured, etc., making it possible to make an accurate economic forecast. It is always surprising that there are no such indicators and prognostic estimates performed by various teams of economists in the development of all kinds of development strategies (Ferreira et al., 2017). The following criteria were used in the Russian Federation (Table 1).

Table 01. The system of indicators of work efficiency of housing and communal services^a

Tasks	Criteria for evaluation
1. Improving the quality of life	An increase in the number of residents, an increase in population incomes, an increase in positive guest reviews, an increase in the flow of tourists, and expansion of economic networks
2. Improving the quality of the living environment	Introduction of new, advanced architectural and planning solutions, visual improvement of the environment, reduction in the number of complaints and lawsuits on the condition of the road surface, improvement of environmental indicators, etc.
3. Improving place in a variety of	Ratings

ratings of the best living areas	
4. Selection and justification of priority areas of activity	GDP growth, confirmation of the estimated efficiency of enterprises, reduction of unemployment, increase in income of the working population
5. Selection and justification of optimal forms and directions of development	The growth in the number of population, the number of new enterprises, the growth of GDP, the increase in income of the working population
6. Identification of sales markets for promising production areas and the search for investors	GDP growth, increase in the trade surplus and foreign trade balance, growth in the number of new enterprises
7. Cash flow control	Reducing tariff growth for all kinds of works and services, in the long term - reduction of tariffs, growth of incomes of the population and communal operators, other enterprises of the construction and communal complexes
8. Modernization and updating of fixed assets	Reducing the number of accidents in the utility sector, mastering new areas of activity, increasing the speed and quality of service, etc.

^aNote: It is developed by the authors.

Some investment is determined, first of all, by the efficiency of investments. Such a popular term in the Russian Federation “funds mastered”, in fact, do not give any idea of the need and profitability of certain investments, both private and budgetary money (Maznitsa et al., 2016).

7. Conclusion

7.1. The first part of conclusion

Summing up the results of the study, we see that modern economic growth is point-like in nature, and in all regions without exception, growth zones are adjacent to zones of depression or zero growth.

Growth occurs in places where infrastructure facilities, raw materials, financial, and intellectual resources are concentrated. In the economic space there are gravitational effects. The available money on the market remains unclaimed during the crisis. This is especially clearly seen in the declining interest rates of bank deposits - the financial system is full of money and does not need them. Many investors are ready to invest in housing and communal services and ask only to create understandable mechanisms and provide guarantees. In our opinion, modernization has several social dimensions. The first is to improve the quality of life (Lizunkov et al., 2017). The second involves increased activity of social groups. After the crisis, there are no clear leaders, and the challenge is to set in motion social groups - primarily technical specialists. It is necessary to prove that money can be earned with brains, and the position of a significant part of our business, unfortunately, is extremely conservative - it is difficult to prove to corporations that they cannot survive without technology. Thus, the meaninglessness of financial investments in large-scale programs should become clear even for regional power structures - again, we will not wait for the result. Everything will be plundered and spent with minimal impact. To implement innovative modernization projects, including those in the housing and utilities sector, a fundamentally new social environment is needed, at least point-wise, from architecture to tax benefits, from new behavioral and technological standards to ordinary human comfort and the concentration of qualified

people in one place. This is precisely the key issue when discussing the scale of innovation and modernization in modern Russia.

7.2. The second part of conclusion

We also want to propose the modernization of the regional housing and communal services not with the entire region, but with the exponential, point-by-point modernization of the public utilities in a single quarter, district or small town. The city of military glory of Kalach - on - Don can become an exemplary training ground. First, you need to conduct a sociological survey of residents - how do they see their city? What is missing above all? Next, you need to determine the economic potential of the city - what can work in it, which enterprises of which sectors of the economy will be successful?

Specialists of our Institute of Architecture and Construction of the Technical University will analyze the use of the funds already collected for housing and communal services, on a separate site they will calculate the depreciation of communications and other fixed assets, the necessary amount of investments. The main thing in our proposal is absolute transparency in the use of collected funds, coordination of tariffs with consumers of housing and communal services. Here, of course, a clear account of the consumption of services is necessary. The consumption volume should be determined by metering devices - we will calculate how much it will cost to install the meter for the tenant, and not for the house as a whole - so that everyone can and wants to save. First of all, we want to interest consumers of housing and communal services - individuals. And there is no need to invest additional significant funds in modernization - we will find losses from already paid services. In this, our program is fundamentally different from those offered so far (De Dominicis et al., 2013).

7.3. The third part of conclusion

In our opinion, the proposed integrated development program may consist of the following sections (directions) (Ergunova, 2017), which should be implemented sequentially:

- A sociological survey of residents, entrepreneurs, public sector employees, managers on the topic “how do you see your city? What production, social projects should be launched in the near future?”
- The assessment of the production and economic potential of the territory and project of a development plan.
- The development of the architectural and construction part of the master plan for development.
- The creation of conditions for the development of various types of tourism
- The development of agricultural processing enterprises, the formation of civilized conditions for the existing roadside trade.
- The assessment of the state of the housing and communal complex.
- The analysis of the formation of tariffs and the efficiency of use of funds collected for utilities.
- The development of innovative directions for reforming the housing and communal services of the city: energy-saving programs in the industry, “Pure Water”, etc.
- The analysis of the effectiveness of implemented innovations

The strict adherence to the algorithm, calculation of costs and economic effects at each stage of implementation will make innovative solutions in the housing and communal services a real engine of the regional economy (Kennedy, 2016; Minin et al., 2019).

The reform point in the housing and communal services (or the reform territory) should become a place of “propagation” of simple solutions that will certainly be in demand. The implementation of this minimum program will confirm that in the future the “reform point” will be able to become an innovation and implementation center of the all-Russian level.

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