

Gulmira D. Bayandina¹

PROSPECTS FOR PUBLIC-PRIVATE PARTNERSHIP IN THE MUNICIPAL SECTOR: THE STUDY CASE OF PAVLODAR, KAZAKHSTAN

The article considers the opportunities for solving certain problems in the municipal sector using the corresponding international experience of attracting private investments. Strong and weak features, threats and opportunities for the development of the sustainable municipal sector in Pavlodar city (Kazakhstan) are demonstrated; a mechanism is suggested developing a partnership between the local self-government and private capital.

Keywords: municipal sector; energy supply; central heating system; water supply; foreign experience; public-private partnership.

Гульміра Д. Баяндіна

ПЕРСПЕКТИВИ ДЕРЖАВНО-ПРИВАТНОГО ПАРТНЕРСТВА В МІСЬКОМУ ГОСПОДАРСТВІ: НА ПРИКЛАДІ МІСТА ПАВЛОДАР, РЕСПУБЛІКА КАЗАХСТАН

У статті розглянуто можливість вирішення окремих проблем міського господарства на основі зарубіжного досвіду залучення приватних інвестицій. Виявлено сильні та слабкі сторони, загрози і можливості розвитку життєзабезпечення галузей міста Павлодар, запропоновано механізм співробітництва місцевих органів управління та приватного капіталу.

Ключові слова: міське господарство; енергопостачання; теплопостачання; водопостачання; закордонний досвід; державно-приватне партнерство.

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Гульмира Д. Баяндина

ПЕРСПЕКТИВЫ ГОСУДАРСТВЕННО-ЧАСТНОГО ПАРТНЕРСТВА В ГОРОДСКОМ ХОЗЯЙСТВЕ: НА ПРИМЕРЕ ГОРОДА ПАВЛОДАР, РЕСПУБЛИКА КАЗАХСТАН

В статье рассмотрена возможность решения отдельных проблем городского хозяйства на основе зарубежного опыта привлечения частных инвестиций. Выявлены сильные и слабые стороны, угрозы и возможности развития жизнеобеспечивающих отраслей города Павлодара, предложен механизм сотрудничества местных органов управления и частного капитала.

Ключевые слова: городское хозяйство; энергоснабжение; теплоснабжение; водоснабжение; зарубежный опыт; государственно-частное партнерство.

Problem setting. Currently in Kazakhstan there is an increasing attention to regional, including urban, development as one of the priority directions of the country's modernization.

However, municipal authorities face a lot of problems inherited from the administrative and planned period and arising at the modern stage of development (Aumagambetov, Alimbayev and Pritvorova, 2006; Chekalin and Nemkin, 2012; Virolaynen, 2006). One of them is the critical situation of the city's communal services, the development of which is mostly performed at the expense of the republican and local budgets.

¹ S. Toraighyrov Pavlodar State University, Kazakhstan.

Comfortable living of city population means constant supply of heating, water, electric power, gas to residential and municipal buildings which demands high level of communal service's organization (Savin, 2004). The current state of the communal infrastructure of the municipal economy in Kazakhstan and in all former USSR is characterized by the constant deficit of capital investments, high degree of wear of fixed assets, huge losses of water, heat, electric power in distribution facilities, a big number of accidents (Financing Strategies for Water and Environmental Infrastructure, 2003).

Under the conditions of budget deficit and simultaneously formed deferred demand for investments into the public utilities sector (Martusevich, 2006), administration bodies with increasing frequency consider the possibility of private investments mobilization for solving the problems of municipal economy taking into account cumulative international experience in the field of state and private partnership.

Latest research and publications analysis. Y.B. Aymagambetov, A.A. Alimbayev and T.P. Pritvorova (2006), P.V. Nemkin and V.S. Chekalin (2012), O.A. Virolaynen (2006), K.N. Savin (2004) studied the issues of managing the municipal economy and its sectoral elements. A.N. Zakharov (2012), S.B. Martusevich, R.A. Sivayev and D.Y. Khomchenko (2006), J.-Y. Hakon (2011) paid much attention in their papers to the peculiarities of integrated development of urban areas on the basis of cooperation of state and private sectors.

Unresolved issues. Although separate aspects of the research are covered wide enough in domestic and foreign economic literature, from our point of view, the level of knowledge about the prospects for cooperation of state authorities and business organizations in solving the municipal economy problems is insufficient.

Currently in Kazakhstan a number of major infrastructural projects are realized on the basis of public-private partnership in the electric power industry and transport infrastructure (The program of state and private partnership in the RK for 2011–2015, 2011). Also different state objects are in property lease or trusting management on the contracts basis. For today there are no examples of realized partnership relations between state authority and business in the sector of municipal economy in terms of concession.

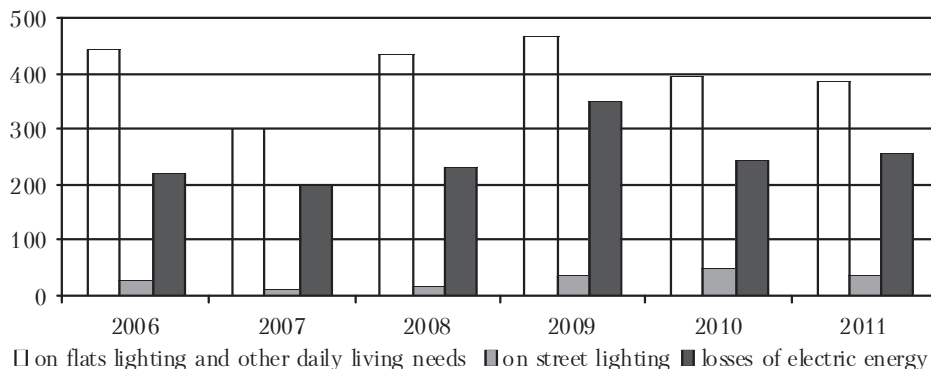
The research objective is to consider the perspectives of attracting private capital flows in solving some problems of municipal economy on the basis of the analysis of the current state of communal infrastructure in Pavlodar (Kazakhstan) and the cumulative international experience of public-private partnership in this area.

Key research findings. Pavlodar is an administrative center of Pavlodar region, a large center of machine-building, metal industry, petrochemical industry, a large junction for railway and motor roads.

"Pavlodarenergo" (joint-stock company) supplies electric and heat energy to the consumers in Pavlodar. The enterprise consists of Pavlodar thermal-power station – 2, Pavlodar thermal-power station – 3, Ekibastuz thermal-power station, "Pavlodarskiye teplovye seti" LLP, "Pavlodarskaya raspredelitel'naya elektrossetevaya kompaniya" joint-stock company, "Pavlodarenergosbyt" LLP (www.pavlodarenergo.kz).

In 2011 the volume of the supplied electric energy to consumers in Pavlodar was 4992.1 mln kw-hours (Statistical bulletin "Electrobalance of Pavlodar oblast", 2006–2011). Traditionally, the largest unit of users was industrial enterprises. On

average, for the period from 2006 76% of the total volume of city's energy was use by them. In Pavlodar in 2011 the growth of electric energy consumption for streets lighting was observed, as compared to 2009 by 9.4 mln kw-hours, in relation to 2007 – by 32 mln kw-hours. The growth of electric energy consumption is also observed on city transport – by 37.6 mln kw-hours in comparison with 2010 (Figure 1). The losses in electricity supply networks have been 257.2 mln kw-hours. Against the background of total growth of energy usage the positive tendency is the reduction of energy usage on flats lighting and other daily living needs of population. In 2011 this indicator was 1132.8 kw-hours per 1 inhabitant of Pavlodar against 1409.1 kw-hours in 2006.



Source: made by the author on the basis of the Statistical bulletin "Electrobalance of Pavlodar region", 2006–2011.

Figure 1. Usage of electric energy in some sectors of municipal economy of Pavlodar, mln kw-hours

Total length of urban air cable lines with voltage 0.4 – 220 kV is 1332.12 km. 90% of them is the property of "Pavlodar Distributive Electricity Network Company" JSC, 10% is in communal property of Pavlodar (SP SM "Department of public utilities sector of Pavlodar for 2011–2015", 2010).

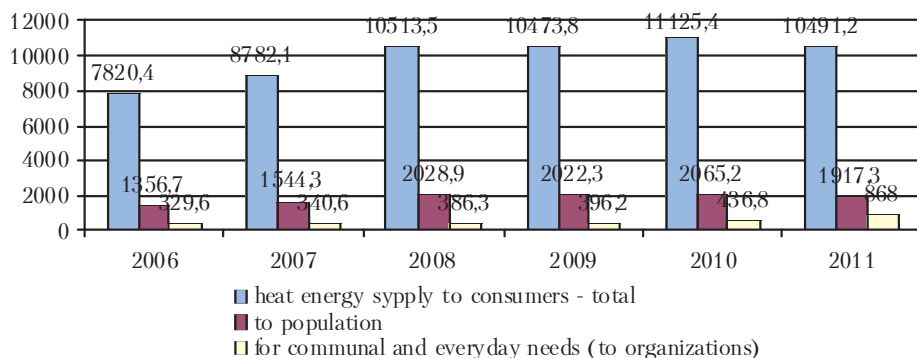
With regard to the growth of energy usage in public utilities sector repair of distribution facilities 10/0.4 kV becomes critical. For example, in the general length of electrical networks 10/0.4 kV within the republic 199488 km, 73% or 145600 km demand repair. The length of urban air lines 0.4–10 kV which are in unsatisfactory condition and demand reconstruction and repair is 259.9 km. Repair of transformer substations 10/0.4 kV, electric main, inside housing distributive systems and circuits is also necessary (Trofimov, 2009; The program of modernization of public utilities sector in the RK on 2011–2020, 2011; SP SM "Department of public utilities sector of Pavlodar for 2011–2015", 2010).

Taking into account natural and climate peculiarities and also the coefficient of wear "Pavlodar Distributive Electricity Network Company" JSC continuously works on the replacement of bare cable by isolated self-holding wire (SHW) that allows raise stability of Pavlodar's electric power industry development on mains elements to the demanded level (SP SM "Department of public utilities sector of Pavlodar for 2011–2015", 2010).

Taking into account severe continental climate the level of heat supply and degree of its development represent a vital important part of power supply in Pavlodar region and particularly in Pavlodar regardless the season. To raise comfort of urban

population living it is necessary to ensure not only centralized heat supply but the centralized conditioning in summer. However, in Kazakhstan the technologies of using warmth for cold production are practically absent. Indoor conditioning with the usage of power-intensive electric conditioners is mainly used (Aliyarov, 2009).

The housing fund of Pavlodar within 2006–2011 has increased by 1112 units with the total area 327 ths m². The volume of investments into housing construction in Pavlodar in 2011 was 3259.4 mln KZT, that is by 1235.2 mln KZT more than in 2010 and in 2012 – 4942 mln KZT (Statistical collection "About Housing fund of Pavlodar region, 2012). Construction of living complexes, schools, hospitals, kindergartens, administrative and business buildings lead to the increase of heat loading due to the widening of the central heating supply system. Unit weight of total area of Pavlodar's housing stock equipped with central heating at the end of 2011 was 83.4%. 10491,2 ths Gkal/h were supplied to the consumers of thermal energy of Pavlodar in 2011 exceeding the same index of 2006 by 2670.8 ths Gkal/h (Dynamic rows of technical and economic indices of thermal station and boiler rooms work in Pavlodar, 2006–2011). The share of thermal energy consumption by the population of Pavlodar within the total heat consumption in the city from 2008 to 2011 was rather stable, at the level of 18–19%. The expenditures on heat for communal and everyday needs of organizations have increased considerably, for example, in 2011 they were 868 ths Gkal/h against 396.2 ths Gkal/h in 2009 (Figure 2).



Source: made by the author on the basis of the "Dynamic rows of technical and economic indices of thermal station and boiler rooms work in Pavlodar, 2006–2011".

Figure 2. Heat energy supply to consumers of Pavlodar, ths Gkal/h

Transfer and distribution of heat energy for consumers of Pavlodar is carried out by "Pavlodar Heating Network System" LLP. The length of the heating system in Pavlodar served by this LLP is 407.2 km, including the trunk line – 103.7 km, inside the city areas – 280.5 km, the systems of hot water supply – 23.0 km. Inside the city residential areas systems and the systems of hot water supply (74.5%) are in communal property of Pavlodar's akimat transferred to the entrusted administration of "Pavlodar Heating Network System" LLP (SP SM "Department of public utilities sector of Pavlodar for 2011–2015", 2010).

Reconstruction of the existing heating systems had not been carried out in Pavlodar practically till 2009, the average physical wear of the heating systems in Pavlodar is about 70%. Despite the started modernization of the heating systems

(<http://pavlodar.gov.kz>) the number of accidents on the sources of heat supply, steam and heat systems within Pavlodar in 2011 was 9.8% of the total republic level (Dynamic rows of technical and economic indices of thermal station and boiler rooms work in Pavlodar, 2006–2011; Statistical collection "Public utilities sector of the Republic of Kazakhstan 2007–2011", 2012).

The total losses of energy in the heating supply systems and hot water supply in separate regions of Kazakhstan (including the Pavlodar region) according to different estimates is from 15 to 40%. Main heating systems are till 20%, distributive systems are 80% from the total quantity of losses. According to the expert estimation, the reasons of huge heat losses in the supply systems are aging and low-grade repair and also low quality of heat isolating layers.

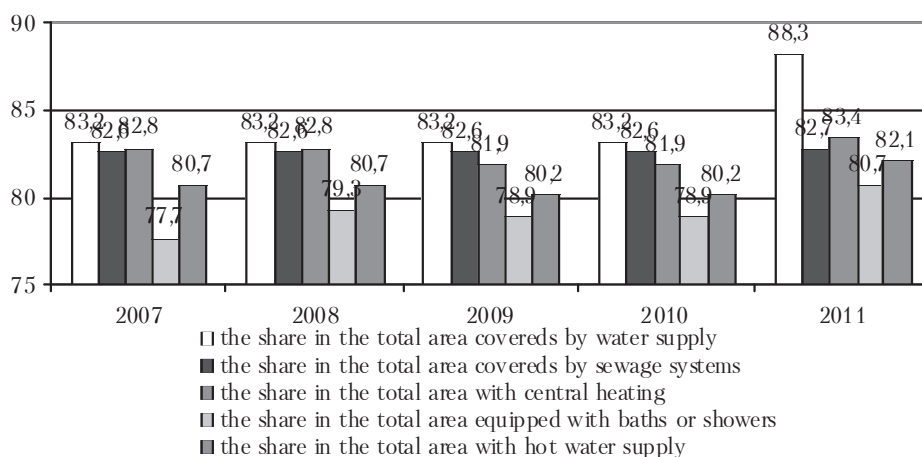
The current systems of heat consumption in the systems of central heating supply (further – SCHS) of Kazakhstan cities as a rule do not have automation and they are characterized by extremely low level of provision with metering devices on heat points that lead to great losses of heat energy and heat carrier in extensive and subdivided heat systems (The Second National Report of the Republic of Kazakhstan on United Nations Convention of Climate Change, 2009).

Currently, inside the house metering devices of heat are present only in 4% of multistorey apartment houses in Pavlodar (Aleksandrov, 2012).

At the same time there is a problem of ineffective energy consumption. According to the statistics in 2011 of Kazakhstan 43% of the supplied heat energy belonged to the housing and utilities sector (Statistical collection "Public utilities sector of the Republic of Kazakhstan 2007–2011", 2012). Moreover, unproductive heat losses in buildings depending on their condition reached 30%. Ineffective heat-insulating enclosing constructions and heat supplying systems, physical wear and their improper service have led to insufficient heat insulation of big number of block of flats. Modern construction companies are not interested in the usage of heat-saving materials during the process of new houses building. The largest potential of energy saving is in housing of Kazakhstan's cities and it is estimated by different experts as from 25 to 50% of real heat consumption. For example, 3 times more fuel is demanded for heating of 1 m² in Kazakhstan in comparison with the same cold country as Finland (The Second National Report of the Republic of Kazakhstan on the United Nations Convention of Climate Change, 2009; Zelenya, 2011).

In developed countries the level of provision of urban population with the centralized water supply is 90–95%. In Kazakhstan, according to the data of Agency of the Republic of Kazakhstan on affairs of construction and housing and communal services on 1 January, 2011 this index was equal to 82% (www.kzvvp.kz).

At the present time multistoried housing blocks of Pavlodar are in full volume supplied with centralized water. The provision with centralized water supply of private houses is 50%, causing the necessity for installation of separating water supply systems from the main water supply systems (SP SM "Department of public utilities sector of Pavlodar in 2011–2015", 2010). Despite the relatively high share of Pavlodar's houses covered by the systems of centralized water supply (more than 80%), the dynamics of joining the biggest number of consumers is absent practically in all positions, slight increase has been observed for multistoried houses and also at the expense of population's own funds in the private sector (Figure 3).



Source: Constructed by the author on the basis of "Statistical collection "About Housing fund of Pavlodar oblast, 2012".

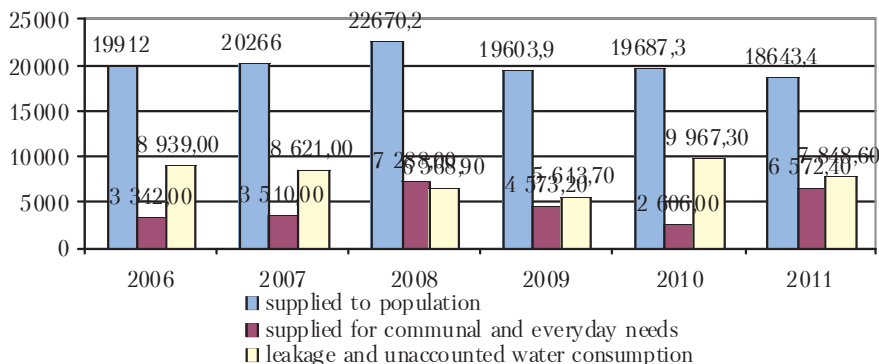
Figure 3. Improvement of Pavlodar's water supply, %

In 2011 in Pavlodar pump stations lifted 81926.5 ths m³ of water including 381.9 ths m³ underground water. In the last years the usage of underground water has been reduced 16 times (Dynamic rows of water supply system and separate water supply networks (form 1-VK) annual, 2006–2011). The usage of underground water for drinking water supply in connection with the worsening ecological situation (<http://newskaz.ru>, 2010) special separate attention because water quality of underground water objects is significantly higher than of the surface water. In the total forecasted resources of underground water in Pavlodar region is 3.8 mln m³/day, operational resources are 0,38 mln m³/day. However, it is necessary to take into account the ecological situation in the city during the process of field production of Pavlodar's underground water (Makintosh, 2005).

The losses of water in 2011 reduced by 2118.7 ths m³ in comparison with 2010 and by 1090.4 ths m³ in comparison with 2006. However, the indices of water losses significantly exceed the volumes used for communal and everyday needs and the real figure can be higher because additional volumes of water losses can be hidden in the overstated standards of consumption (Figure 4).

The municipal system of water supply and water removal of Pavlodar includes 483 km of water supply systems; 384.49 km of drainage systems. According to the contract of property lease, 451 km of water supply and 382 km of drainage systems which are in communal property of the city are transferred to the lease service of "Pavlodar-Vodokanal" LLP for rendering water and sewage services. According to the contract conditions the rental payment for this property is made by the volume of amortization expenses without refinancing rate and remains in disposal of the enterprise for renovation, reconstruction and modernization of rental property. The systems of water supply and water removal with the total length of 34.49 km which are not assigned to any legal entity need annual repair for saving of existing free pressure and provision of reliable and stable operation of the whole system of water supply and

water removal. Funds provided from the local budget are used for their service and removal of emergency damages.



Source: Constructed by the author on the basis of "Dynamic rows of water supply system and separate water supply networks (form 1-VK) annual, 2006–2011".

Figure 4. Water consumption in Pavlodar

Currently more than 400 km of urban system of water supply and water removal of Pavlodar have 100% wear. In 2011 the number of accidents in the water supply systems was 606 cases, that is 73 less than in 2010, but almost 2 times higher than in 2009 (SP SM "Department of public utilities sector of Pavlodar in 2011–2015", 2010).

In Pavlodar there is a problem of waste water gathering because part of the city's districts is not equipped with sewage treatment facilities that as a result of poor sanitary, epidemiological and ecological situation in the city, dirty soils. Discharge of sewage is carried out illegally and without any control.

Solving the problems mentioned above demands significant investments. It is difficult under the conditions of budgetary funds insufficiency. According to this, municipal authorities should attentively study the experience using different forms of public-private partnership because international practice of modernization of communal infrastructure confirms the efficiency of such cooperation.

For example, state authorities in France tried to use private entrepreneurs to develop at business expense but under the state control the communal servicing of citizens (Vikhryan, 2003). The peculiarity of this French model is the adaptability of its structure to changeable conditions. State, local authorities and power structures of different levels are participating jointly. There is no common law regulating all forms of SPP in France. Regulatory acts and norms of administrative and civil rights are being developed for each form separately (Zakharov, 2012).

For the purposes of power saving and power efficiency in France SPP projects are realized in the sphere of communal heat supply systems, street lightening and in other spheres of communal infrastructure.

Street lighting in France is a powerful segment of the municipal economy: 9 mln of light bulbs with the total power 1.3 GВт; the constant growth of unit weight of energy consumption (on average, 20 kWt per 1 inhabitant within the period 1990–2000). For example, 2% of all energy consumption and 4% of greenhouse gases emissions into the atmosphere are connected with street lighting.

Currently, about 20 signed contracts on street lighting are signed in France, that is a half of all contracts on cooperation signed by communes and administrative and territorial units of different levels. In Rouen 100 mln EUR were invested by the contract of SPP and 16,000 lighting points were created. The contract has been signed in 2007 for the period of 20 years and its purpose is to decrease the power consumption on 30%. These contracts mean to provide different services: trichromatic signalization, lighting of state enterprises, holiday lighting, video observation, movable borders of footways, Wi-Fi stations installed on lanterns etc. (Hakon, 2011).

Concession agreements are widely represented in water consumption and water removal. For instance, in Nice Generale des Eaux a company has been managing engineering systems of the city since 1864. It regularly prolongs the terms of this concession agreement (Goryachiy, 2012).

The development of SPP in the sectors of municipal economy is a feature of developing countries and also of some countries with transition economy.

The most noticeable example of international experience in the realization of public-private partnership in the municipal economy is the concession of water supply in Buenos Aires. The peculiarity of this example is that the contract of concession has been signed immediately without preliminary signing contracts for managing, renting and contract preparation of concession has become unprofitable in time and means. The reasons for private operator attraction were the relatively low level of access to services of the central water consumption (only 70% of Buenos Aires's population) and to sewage services (58%), the high degree of wear, absence of metering devices in most flats, low paying ability of the population. As a result, new lines were constructed, new consumers were powered, the efficiency indices increased manifold (Martusevich et al., 2006).

Conclusions and prospects for further research. Subject to the analysis of the main data on the public utilities work, and basing on the state and regional policy documents, we can define the strengths and weaknesses, opportunities and risks of the public utility sector of Pavlodar (Table 1).

These structured description proves the need and opportunity to attract private investments to solve the public utilities' sector problems, and, therefore, the topicality of working out the corresponding mechanisms (Figure 5).

To attract private capital to solve the problems of municipal services, it is necessary, first of all, to have the local executive authorities initiate the following:

- select the objects of the municipal services sector to be urgently invested;
- learn thoroughly the international experience of the public-private partnership in this area;
- form the requirements package for investors including environmental, social, historical and other peculiarities of the city interest;
- review the terms of contracts and agreements of beneficial ownership because of low efficiency;
- work out the legal, economic fundamentals of concession agreements in the municipal services sectors;
- create the regulatory agency with the functions of the public-private partnership center that would work at the regional level.

Table 1. SWOT-analysis of the public utility sector in Pavlodar, developed by the author

<p>Strengths</p> <p>Availability of own heat and power supply sources. Availability of surface and underground sources of fresh water. Stably functioning market channels of the utility area services. Prospects for expanding the market channels of these services. Prospective attractiveness of public utilities branches for private funds. Availability of the Republican and regional programs on modernizing public utilities branches.</p>	<p>Weaknesses</p> <p>The critical level of the physical wear of fixed assets (60-70%). Outdated equipment. High indices of power supply, heat supply, water supply and water removal losses Because of the harsh climate there is a time limit for fulfilling construction works, modernization, repairing. Underdeveloped system of energy and water accounting meter. Insufficient usage of underground fresh water deposits. Limited and insufficient state and private investing to develop the systems of public utilities Non-competitive environment. No real information about the availability and condition of communal infrastructure assets. Experts of the city/akimat are not interested in solving the problems of public utilities. No highly qualified staff and managerial human resources of a "new bread". No reporting in media (publicity) about the carried out activities and the achieved results Low rate of population activity when solving the public utilities' problems High level of anthropogenic impact on the environment.</p>
<p>Opportunities</p> <p>Attract private investors to develop the public utilities' branches within the framework of public-private partnership. Implement innovative resource-recovery technologies and materials. Install energy, heat and water accounting meters. Increase the quality of municipal facilities. Increase the level of city housing funds improvement at the expense of widening the power, heat and water networks. Hold the inventory of municipal utility assets and creating the united database of the city. Increase the qualification level of personnel. Growth of public spirit and people's activity when solving the problems of the public utility sector.</p>	<p>Threats</p> <p>Possible failure of equipment, growth of the accidents rate, losses. Lowering the quality of the supplied water, heat and power. Low financial solvency of population to pay for the public utility services, because of the outstripping growth of tariffs against the growth of income. Worsening of environmental, sanitary and epidemiological situation. Social tension.</p>

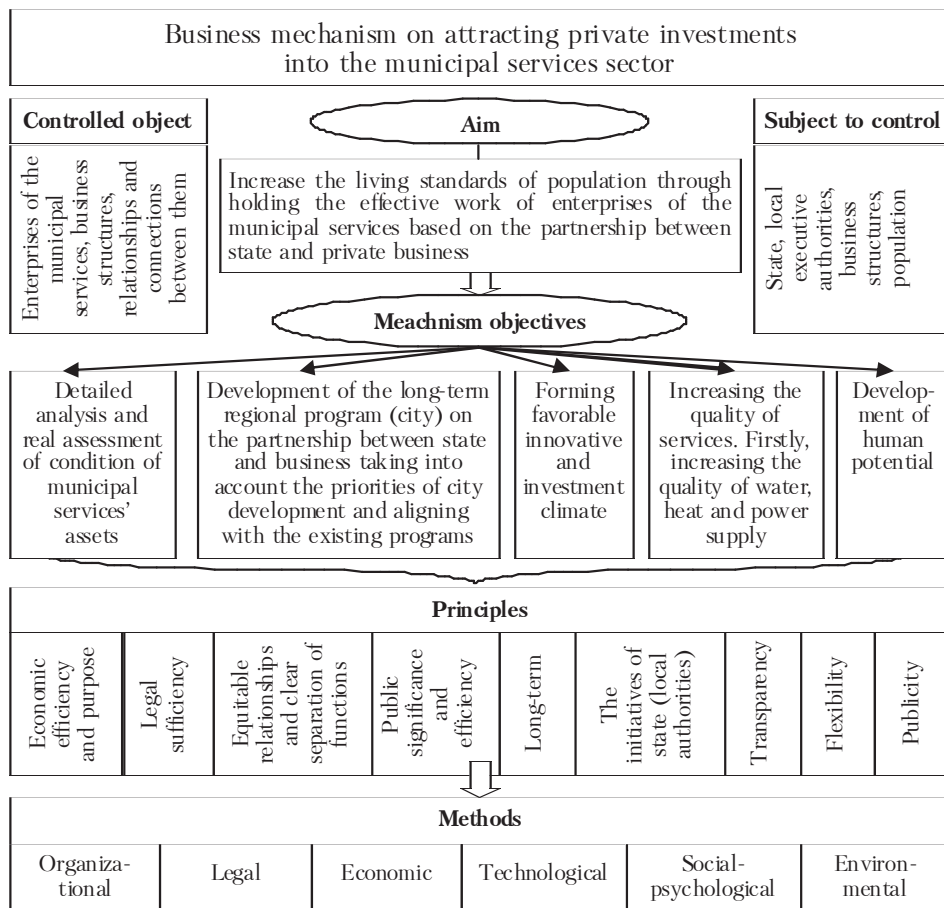


Figure 5. The business mechanism of attracting private investments to the municipal services sector, developed by the author

In parallel, it is necessary to make the preparatory works:

- the complete inventory of the municipal services assets;
- making the integrated database of the municipal services assets;
- working out and implementing the system of the service quality standards, with monitoring;
- expanding the statistic system of indices reflecting the development of the municipal services sector;
- searching and participating to get grants and consultations from the international organizations' programs.

Thus, the opportunities for development of the partnership between state authorities and business within the municipal economy are rather wide, but they need comprehensive preparation.

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