REPORT

Improving City Infrastructure Management in Uzbekistan: Problems and Search for New Mechanisms and Instruments

Tashkent-2011
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<tr>
<td>ADB</td>
<td>Asian Development Bank</td>
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<tr>
<td>AMS</td>
<td>Automatic Management System</td>
</tr>
<tr>
<td>BTI</td>
<td>Bureau of Technical Inventory</td>
</tr>
<tr>
<td>CCI</td>
<td>Chamber of Commerce and Industry</td>
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<tr>
<td>CER</td>
<td>Center for Economic Research</td>
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<tr>
<td>CG</td>
<td>Consumer Goods</td>
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<tr>
<td>CHS</td>
<td>Central Heat Supply</td>
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<td>CIMD</td>
<td>City Infrastructure Management Departments</td>
</tr>
<tr>
<td>CMR</td>
<td>Cabinet of Ministers Resolution</td>
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<td>FDI</td>
<td>Foreign Direct Investments</td>
</tr>
<tr>
<td>FRD</td>
<td>Fund for Reconstruction and Development</td>
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<tr>
<td>F&amp;L</td>
<td>Fuel and Lubricants</td>
</tr>
<tr>
<td>FUR</td>
<td>Fleet Utilization Rate</td>
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<tr>
<td>GDP</td>
<td>Gross Domestic Product</td>
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<tr>
<td>HGE</td>
<td>Heat Generating Equipment</td>
</tr>
<tr>
<td>HS</td>
<td>Heat Supply</td>
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<tr>
<td>HS Co</td>
<td>Hear Supply Company</td>
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<tr>
<td>HUM</td>
<td>Housing and Utilities Management</td>
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<tr>
<td>IA</td>
<td>Installation Department</td>
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<tr>
<td>IAS</td>
<td>Information and Analysis System</td>
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<tr>
<td>IIDP</td>
<td>Infrastructure Improvement and Development Programs</td>
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<tr>
<td>ME</td>
<td>Ministry of Economy</td>
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<tr>
<td>MF</td>
<td>Ministry of Finance</td>
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<tr>
<td>MI&amp;E</td>
<td>Monitoring Instruments and Equipment</td>
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<td>MIA</td>
<td>Municipal Improvement Administration</td>
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<td>MID</td>
<td>Mobile Installation Department</td>
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<tr>
<td>PF</td>
<td>Performance Factor</td>
</tr>
<tr>
<td>PHA</td>
<td>Private Homeowners' Association</td>
</tr>
<tr>
<td>PP</td>
<td>Plastic Pipes</td>
</tr>
<tr>
<td>PPP</td>
<td>Public-Private Partnership</td>
</tr>
<tr>
<td>RDF</td>
<td>Reconstruction and Development Fund</td>
</tr>
<tr>
<td>RoU</td>
<td>Republic of Uzbekistan</td>
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<tr>
<td>RRF</td>
<td>Republican Road Fund</td>
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<tr>
<td>RSW</td>
<td>Residential Solid Waste</td>
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<tr>
<td>SB</td>
<td>Small Business</td>
</tr>
<tr>
<td>SMEs</td>
<td>Small and Medium-Sized Enterprises</td>
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<tr>
<td>SSC</td>
<td>State Statistics Committee</td>
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<tr>
<td>SWM</td>
<td>Solid Waste Management</td>
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<tr>
<td>UNDP</td>
<td>United Nations Development Program</td>
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<tr>
<td>UTS</td>
<td>Urban-Type Settlement</td>
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<td>WSS</td>
<td>Water Supply and Sewage</td>
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The Project team would like to thank Dr. Adnan Aliani and Mr. Kyungkoo Kang (ESCAP) for assistance in successful project implementation. We also express our special gratitude to Dr. Alexander Puzanov, Director of the Institute for Urban Economics (Russia), for the insightful comments and recommendations during the development of the report.
EXECUTIVE SUMMARY

The relevance of management urban infrastructure in Uzbekistan is connected, first of all, with high rates of urbanization. One of the distinct outcomes over the past 20 years in Uzbekistan is the acceleration of the urbanization triggered by domestic migration and outflow of excessive rural labour force to urban areas. In the near future, the expected population growth and continued inflow of new residents will essentially put additional pressure on urban infrastructure. In addition, decline in water production in the past 10 years led to decrease in supply of drinking water from 94.1% in 2001 to 88.6% in 2010 in urban areas. Only 32% of cities have a centralized sewage system which covers 51.5% of urban population. Meanwhile, the most of the urban infrastructure has difficulty relating to the ineffective management. Technical backwardness of the enterprise is high energy and excessive costs, which leads to a deterioration in their economic situation. Management of urban infrastructure of relevant enterprises and organizations responsible for local administration (Khokimiyats). However, the competence and powers of public authorities in the field, forms and methods of management of the urban infrastructure does not meet modern requirements. A key problem is the inconsistency of the institutional system, mechanisms for managing urban infrastructure requirements of a modern rapid industrial-innovative development of the economy. Critical assessment of the situation, forecast trends of urbanization, showed the need to move to a new management system of urban infrastructure. Along with improved governance, measures to improve the regulatory and legal framework for the development of urban infrastructure, in particular:

Heat supply
Develop a system of subsidies for production, acquisition and installation of metering of heat energy. Adopt a Program insulation of apartment buildings, aiming to reduce heat energy consumption by 30-35% in 2020.

Power Supply
To amend the law of the Republic of Uzbekistan "On Power" from 9/30/2009, and "Rules of electrical energy", approved by the Cabinet of Ministers dated 22.08.2009, № 245, towards the improvement of accounting and consumption of electrical energy, the tightening of the responsibility for violation of the rules for using electricity and natural gas. Develop and adopt a program of energy conservation in the residential sector with guidance to achieve energy savings of 35-40%.

Water and sanitation
Two major sectors, namely, urban water supply and sanitation (WSS) and solid waste management (SWM) have a common major development challenge – meeting the growing demand for quality services – that require sizeable investments to rehabilitate and modernize 40-years-old infrastructure as well as substantial reforms in the sector governance. The Government's Welfare Improvement Strategy for 2007-2010 defined that improved access of urban and rural households to safe drinking water and sewage facilities, from its 2006 level by 50 percent by 2015. The main factors affecting the supply and quality of drinking water are old equipment for water filtration; financial complications; the infrastructure in rural areas; and low public awareness on the environmentally-friendly use of drinking water. The second WIS is currently being developed to address key living standards implications. The National Water Supply and Waste Water System Development and Modernization Plan for 2009-2020 is the principal document in the WSS sector. It sets out the overall strategy of the WSS and the key strategic policies against which all development will be assessed. According to this Plan the Government targeted close to 100% water supply coverage in most urban areas and 85% in rural areas by 2020. These targets are backed by a policy framework and a sector investment plan amounting to $1.2 billion by 2012 and $2.9 billion

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1According to UN publication on “World Population Ageing 1950-2050” population of Uzbekistan will reach up to 34.2 million people by 2025 and 40.5 million by 2050.
by 2020. Main development goals which the Government is setting up before the WSS sector include: i) improve WSS services, particularly to provide universal access to drinking water and improved quality of water; ii) ensure financial sustainability of WSS sector enterprises; iii) promote water saving by different means; and PPP promotion to increase efficiency.

**Solid Waste Management**

The RSW is mainly generated in urban areas of the Fergana Valley, Tashkent and Samarkand regions. There are 142 state-owned landfills and dumps operating in the country. Only 20 percent of these facilities are equipped with RSW collection and control points. Majority of the landfills and dumps are already operates beyond their projected deadlines. Small size of enterprises (collection, transportation and disposal) in the sector does not allow implementation of complex and large scale investment projects. In parallel to underdeveloped official recycling, informal waste collection practices are widely used.

**Strengthening the role of local budgets in the development of urban infrastructure**

The system of public finance in Uzbekistan is still evolving. The main driver change is the introduction of treasury execution of the budget, the expansion of authority and responsibilities of the Treasury's control over the use of public and quasi-public sector. However, the Public Finance Management reform need support in terms of building capacities of the Treasury to perform its control and oversight functions without impeding operations in the sectors, as well as wider changes are required into policy-making mechanisms to mainstream results based management principles.

To develop a law on the budget process, which should be mandatory drafting of local budgets in relation to socio-economic development of cities, a clear definition of the order of distribution of income and expenditure between budgets, ensuring the reduction of financial dependence of local budgets and local administration incentives to increase their own revenue potential, delineation of expenditure responsibilities of state and local budgets, and developing mechanisms for dealing with intergovernmental relations.

The new management system of urban infrastructure, as evidenced by the experiences of developed countries, has the potential to enhance investment in infrastructure, promoting cost optimization of heat consumption, power supply, drinking water supply, management of urban solid waste, improve the quality of urban life.
1 BACKGROUND

1.1. Introduction

Urbanization is a global process\(^2\), with many countries experiencing this phenomenon currently in various forms, depending on the level of social and economic development, geographic location and specifics of undergoing demographic processes. The States of the South Caucasus and Central Asia except Kyrgyzstan and Tajikistan, show a steady increase in urban population. Uzbekistan displays an rate or urbanization which is in the higher brackets, compared to a selected list of comparator countries, as shown in Table 1.

<table>
<thead>
<tr>
<th>Country</th>
<th>The urban population (%)</th>
<th>Rate of urbanization 2010-2015 estimate, (% per annum).</th>
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</thead>
<tbody>
<tr>
<td>Azerbaijan</td>
<td>52</td>
<td>1.4</td>
</tr>
<tr>
<td>Armenia</td>
<td>64</td>
<td>0.5</td>
</tr>
<tr>
<td>Georgia</td>
<td>53</td>
<td>-0.4</td>
</tr>
<tr>
<td>Kazakhstan</td>
<td>53</td>
<td>1.3</td>
</tr>
<tr>
<td>Kyrgyzstan</td>
<td>35</td>
<td>1.3</td>
</tr>
<tr>
<td>Russia</td>
<td>73</td>
<td>-0.2</td>
</tr>
<tr>
<td>Tajikistan</td>
<td>26</td>
<td>2.2</td>
</tr>
<tr>
<td>Turkmenistan</td>
<td>50</td>
<td>2.2</td>
</tr>
<tr>
<td>Uzbekistan</td>
<td>51.7</td>
<td>1.4</td>
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</tbody>
</table>


As a necessary medium in meeting the needs of the growing urban population, the urban infrastructure is gaining an increasingly more important role in states’ strategies, aimed at modernizing their economies. This, in its turn, necessitates the setting up efficient systems for managing city infrastructure, based on new mechanisms for management and strategic approaches to city development. Such new mechanisms should be oriented towards the improvement of the quality of life, increasing the efficiency and integrity of the city development, creation of the most favorable conditions for competitive market structures to function effectively and for attracting foreign and domestic investments.

The urgency of conducting a research into the options and ways of improving the management of urban infrastructure in Uzbekistan is prompted primarily by the high demographic growth. This happens at the time when a large part of urban infrastructure is undergoing a crisis, caused by the considerable gap between the capacity of the infrastructure and the rates of urbanization and GDP growth and low levels of return on investments in infrastructure. Utility networks require increasingly more funds for maintenance. The technical gaps cause increasingly higher levels of power consumption and excessive costs for the industrial enterprises, leading to the deterioration of

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\(^2\) Urbanization (Latin, urbanus - city) – is a process of increasing role of cities in the development of a society. The premises for urbanization include: growth of industry in cities, the development of their cultural and political functions, deeper territorial division of labor, etc. An inflow of rural population into a city, and growing shuttle movement of the population from villages and nearby small towns to large cities (to work, to satisfy cultural and general needs, etc.) are characteristic features of urbanization.
their net income. Considerable needs for capital investments in the infrastructure sector, among other factors, prevent the urban infrastructure from reaching the point of meeting the present-day requirements of the urban population.

Local authorities are falling behind in terms of fulfilling the requirement of the Government of the Republic of Uzbekistan (RoU—hereafter) to transform infrastructure companies into financially self-sustaining entities. Due to the reforms taking place in the country, the management of city infrastructure and coordination of the activities of related entities and organizations, became the responsibility of local authorities. However, the scope of competence and authority of local authorities, as well as the forms and methods of managing city infrastructure, do not meet contemporary requirements.

A sustainable development of cities presumes uninterrupted supply of infrastructure services.

*City infrastructure* - is a complex system of industries, which together provide the necessary basis for the operation of the various buildings and services in settlements, and creating conveniences and comfort for people to live and stay in such buildings and using the services by providing a wide range of housing and utility supply services.

The main tasks of the Housing and Utilities Management (HUM) are:

- *supply of heat and hot water* to residents (ensuring the operation of boiler-stations and thermal power plants);
- *supply of drinking water* (installation and repair of water pipes, water intake treatment and delivery of water to houses, apartment blocks and industrial sites, as well as for further heating to supply hot water and heat);
- *supply of electricity*;
- *supply of gas*;
- *collection, removal and disposal of waste*;
- *sewage* (discharge of effluents);
- *routine cleaning* of public places.

The report does not cover transport, communications and other city infrastructure as well as environmental protection issues, which are all important issues in the context of accelerating urbanization. The study also does not cover issues related to structural reform of utility companies (e.g. vertical unbundling) and institutional set up of regulatory matters.

The main problems underlying the poor state of infrastructure services could be grouped into technical, economic, financial, administrative, and management-related issues. What is common for all of the problems is the poor coordination and management by local government authorities, and inadequate financial, investment, economic and other regulatory instruments.

- A part of the enterprises and organizations, responsible for certain parts of municipal infrastructure, are natural monopolies. However, no efficient mechanism for management

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4 During the last ten years, the volume of heat supply to cities and residential areas of the RoU, reduced by 16%. The number of decayed heat supply grids increased by a third. The losses in heat and electricity supply systems exceeded 60% and 35%, respectively. Losses in water supply system increased by 40%. One third of the heads of small Businesses, surveyed in 2009 said that they stopped expanding their business due to frequent disruptions in electricity supply (Appendix 17).
and oversight of their activities has been established. The economic mechanisms of interactions between the producers of services, their consumers and intermediaries are not properly regulated.

- The operation, maintenance and development of municipal infrastructure is financed mostly from the state budget, and the amount of this financing is growing from year to year.

- There is a lack of objective data regarding actual level of housing and utility supply services. The outlay of HUM, in particular, with regards to the supply of heat, water, collection, removal and disposal of waste, sanitation, sewage (discharge of effluents), routine cleaning of public places, is based mostly on approximate data.

- The poorly maintained networks add to the high costs of production. Costs incurred due condition of infrastructure and poor-quality repairs, as well as inefficient operation of utility networks are born by the state budget and the population.

- Due to many reasons, including inefficient financing of urban infrastructure there is a large staff turnover of workers and specialists. From 2004 to 2009, the share of urban infrastructure employees reduced by a third. The share of new employees who had just joined the urban infrastructure system, constituted 24%.

At present there is a lack of studies in Uzbekistan addressing such issues as: decentralization; improvement of urban governance, improving local (municipal) budget management; increasing role of local budgets in infrastructure development; creating mechanisms of private sector involvement in process of implementation of infrastructure projects in urban areas. Since all Central Asia countries have common past, including legacy in the sphere of urban infrastructure, the Project experience may be extended to other Central Asian countries.

There is an increasing need to formulate conceptual framework which will incorporate and link together different aspects of municipal governance system improvement to identify the development agenda up to 2015 and beyond. Thus, the main objective of the research project “Improving City Infrastructure Management in Uzbekistan: Problems and Search for New Mechanisms and Instruments” is to formulate conceptual framework which will incorporate and link together different aspects of municipal governance system improvement to identify the development agenda for the medium term.

The objective of this research is to develop suggestions related to the improvement of city infrastructure management, as one of the fundamental building blocks for any city, which is turning into an industrialized center.

The main tasks of the research are:
- analysis of demographic trends and urbanization in Uzbekistan;
- analysis of the current state of city infrastructure;
- analysis of institutional problems, affecting the city infrastructure;
- analysis of local budgets and current system of inter-budgetary relations, and their impact on the implementation of infrastructure projects in cities;
- review of international experiences in managing city infrastructure; and
- developing recommendations related to the improvement of the management of the city infrastructure taking into account the experiences of developed countries.

The report is organized as follows.

• **Chapter 1** addresses the context of urbanization in Uzbekistan, the main issues and challenges in the management of urban infrastructure, including those related to funding, monitoring, and technological development.

• **Chapter 2** describes the main policies which are important in the context of urbanization.

• **Chapter 3** describes the trends in the access to infrastructure services and the underlying factors.

• **Chapter 4** presents the main findings and proposals.

Information used in this research includes:

i) research and policy papers;

ii) results of expert surveys, "round tables", held at regional and city administrations (Khokimiyats), cities of Tashkent, Chirchik, Akhangaran, Namangan;

iii) regulatory and legal acts that govern the activities of infrastructure companies;


### 1.2. Political Context of Urbanization

The growth in urban population should be considered within the context of the following trends. In the future, the country is highly likely to face a deficit in water and land resources.

- During the last 25 years, the area of arable lands reduced from 0.22 to 0.12 hectares per person. The decrease in land resources, and increase in the productivity in the agriculture may release a certain part of working-age population.

- Starting from 2000, the number of population leaving rural areas is around 100-110 thousand per year. A considerable part of this migration flow settles in cities and urban-type settlement.

It is apparent that a painless absorption of human resources, including those arriving from villages to cities, is possible provided there is a considerable increase in the capacity of the city infrastructure. In this connection, of key importance is the problem of expanding urban territories, and therefore, the additional load on the city infrastructure.

### 1.3. GDP Growth and Economic Change

The Uzbek economy has remained largely resilient to the global economic crisis and economic contraction among its major trading partners. GDP growth remained robust at 8.1 per cent in 2009. Early in the global crisis the Government of Uzbekistan embarked on a substantial fiscal stimulus package equivalent to 4 per cent of GDP. The package included substantial public infrastructure investments, tax reductions for exporters and small and medium-sized enterprises (SMEs), an increase in public sector wages and recapitalisation of commercial banks. The package benefited in 2009-10 from healthy budget revenues and good export performance, and was financed through the government budget, state-owned enterprises and the Fund for Reconstruction and Development (FRD), a sovereign wealth fund, established in 2006.

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At the beginning of 2010 the government introduced various tax cuts, including a reduction of 1 percentage point in the rates of profit tax and personal income tax. The economy is forecast to continue to grow strongly in 2011-2015. And the urban area will play a key role in further developing the economy of the Republic of Uzbekistan.

1.4. Classification of Cities

In Uzbekistan, there are 119 cities, including:
Republican Subordination - 3
Regional Subordination - 26
District subordination - 90

Cities are categorized according to the number of population:
Largest city - population over 1 million people.
Large cities - population of 100 thousand to 1 million people.
Medium-sized cities - population of 50 thousand of 100 thousand people.
Small town - population 50 thousand people

As of July 1, 2011, the number of medium-size cities in Uzbekistan is 67 (or 56% of total number of cities). Their population is around 2,545 thousand. Large cities with population exceeding 100 thousand constitute 14% of the total number of cities, and 53% of the country’s urban population reside in such cities. The growth of population in large cities during the last 10 years constitutes 107.6%, in medium-sized cities - 109.6%, and in small cities - 107.2%.

1.5. Urban Population Growth and Migration

During the years after Uzbekistan gained independence in 1991, the demographic situation is characterized with a sharp increase in the absolute growth of population, levels of migration and urbanization. According to State Statistics Committee of the RoU, as of June 1, 2011, over 14.65 million people, or 51.4% of the population, reside on a permanent basis in cities and in urban-type settlements (UTS) (see Figure 1). Compared to 1996, the share of urban population increased by 5,792 thousand people, or nearly 64%. The forecast is that the up until 2050, the high rate of growth in total population numbers will continue. According to forecasts, in 2025, the population of Uzbekistan will reach 33.4 million people, and in 2050 - about 43.9 million people, which will, in turn, result in a proportional increase in the numbers of urban population.

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9 In the past ten years, an average annual growth of population in the RoU reached 1.2%.
2 LOCAL GOVERNANCE AND MUNICIPAL FINANCE

2.1. Local Governance

The Activities of local public authorities are governed by the Constitution of the Republic of Uzbekistan, the Law of the Republic of Uzbekistan "On state authority" from September 2, 1993 and other laws.

Figure 2 Public Administration/local governance

One of the major constraints for urban development is the current layout of local governance system in terms of distribution of powers and responsibilities among regional, district and city administration bodies, especially in managing the budgets.

Today khokims (local governors) of small and medium-sized cities, which are administrative centres of rural areas, are subordinated to the district administration. District administration is mostly focused on the problems of the agricultural complex (cotton and crop production, providing support to the private farmers etc.). As a result local budgets are usually allocated not in favor of urban development infrastructure.

Powers of regional, district and city councils and hokimiyats are all addressed by the Law on Local Public Administration; however, the law fails to specify clearly their functions and authority. The scope of competence and authority of local government bodies is unclear. The system of financing the city infrastructure has very little to do with local authorities and is hardly tied to the local budgets.

2.2. Municipal Finance

Strengthening the capacity of regions and local budgets and gradual decentralization of budget authorities allowed to optimize state budget spending and to provide for an increase in the income-generation capacity of the regions. The number of taxes and payments, allocated to the Budget of
the Republic of Karakalpakstan and local regional budgets reached 87 by 2011 (in 1996 this number was 60)\textsuperscript{10}. This resulted in an increase in the spending of the Republic of Karakalpakstan and local budgets in the State Budget from 41% in 1996 to 55% in 2008.

As indicated in Table 2, during 2009-2011, the share of local taxes and other mandatory payments averages about 13% of the total local budget income. Subventions and subsidies to local budgets averaged approximately 20%. The major part of over 60% is accounted by regulated national taxes, which are allocated to local budgets. The share of investment expenditure in local budgets (planned figures) is 9% of total local budget spending in 2008 and 4% in 2011. The main part of spending, respectively 91% in 2008 and 96% in 2011, is current expenses of local budgets. When determining rates for a respective year, the analysis of previous year's revenues and expenditures and current meeting of targets are taken into account.

In 2010, 8 regions of the country were subvention-recipients and received funding from the republican budget to pay employer withholdings and social benefits, and to cover centralized investments, while 1 region was a subsidy-recipient. These local budgets' incomes failed to cover their expenditures. Hence, the allocation from national taxes and other mandatory payments to these regions was generally set at 100%. In other regions, these rates were set at a lower level. National taxes are distributed to district and city budgets depending on their expenditure, which is determined as part of an agreement between higher- and lower-level financial authorities.

<table>
<thead>
<tr>
<th>Table 2: Structure of Local (Oblast) Budgets in Uzbekistan (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item</td>
</tr>
<tr>
<td>---------------------------------------------------------------</td>
</tr>
<tr>
<td>Revenues</td>
</tr>
<tr>
<td>Revenue from national taxes and other mandatory payments</td>
</tr>
<tr>
<td>Revenue from national taxes and other mandatory payments</td>
</tr>
<tr>
<td>Local taxes and other mandatory payments</td>
</tr>
<tr>
<td>Local taxes and other mandatory payments</td>
</tr>
<tr>
<td>Subventions. subsidies</td>
</tr>
<tr>
<td>Subventions. subsidies</td>
</tr>
<tr>
<td>Expenditure</td>
</tr>
<tr>
<td>Current expenditure</td>
</tr>
<tr>
<td>Current expenditure</td>
</tr>
<tr>
<td>Capital expenditure (investment expenditure)</td>
</tr>
<tr>
<td>Capital expenditure (investment expenditure)</td>
</tr>
</tbody>
</table>

Source: Ministry of Finance of the RoU

The following can be listed among the main problems of funding local city budgets:

1. **Lack of common legislative framework on budgeting** The inconsistency of legislative acts on budgeting causes redundancy and contradictions between certain regulations of the budgeting process, making the job of participants of the budgeting process more difficult:

---

\textsuperscript{10} Main local taxes and other mandatory payments are the tax on municipal improvement and social infrastructure development, property tax from legal entities and individuals, individual tax on the consumption of gasoline, diesel fuel and gas in vehicles, and land tax.
financial and treasury bodies, controlling bodies, recipients of budget funds, bodies responsible for distributing targeted off-budget funds, and inflow administrators.

2. **Imperfection of the system of local taxes and other mandatory payments.** As shown in Table 3, major local taxes and other mandatory payments constitute about 13% of local budget revenues. One of the main types of local taxes is the property tax: however there are certain issues with the application of this tax, which restrict the flow of this tax to local budgets. The rate of the property tax and the taxable base are determined by the resolution of the President of the Republic of Uzbekistan. The taxable base is often reduced due to preferences and exemptions, which can be granted by local authorities in a government-established manner. A large number of preferences available for this tax also restrict using its potential for the benefit of local budgets. Revenues from regulatory taxes remain a considerable source of income for local budgets. A significant increase in these is notable (over 60%), and is attributed to the growing needs of local budgets due to the increase in their expenditure commitments.

3. **Statutory regulation of certain government functions is performed by central government, while their actual implementation is imposed on local authorities.** The transfer of authority to perform a function to the local level can be accompanied with the transfer of respective financial assets, i.e. its funding. Such transfer can take place in the form of a specific-purpose allocation of funds from an upper-level budget to lower-level budgets (subventions), and in certain cases no funding from a higher-level budget is provided. In the first case (secure obligations), the authority to perform a function is divided into the authority to provide financial means and the authority to administer. Such division leads to the weakening of responsibility of state authorities in terms of forming the revenue side of the budget, and provides incentive for increasing expenses to perform the function that is financed from the upper-level budget. Before, the distribution of all capital expenditure was done at the central level.

4. **Lack of required statistical information.** The required statistical information would reveal the real picture in terms of the introduction of infrastructural projects financed from centralized funds, including local budgets, within the framework of accelerating the processes of urbanization and development of cities as centers of the industrial production and improving the quality of services to-date, as neither statistical bodies, nor any other local administration or government bodies (in districts and in cities) collect detailed information

5. **Lack of private sector participation in the construction and operation of infrastructural objects.** Public-Private Partnership (PPP) are a common instrument now in many industrialized countries and increasingly so in transition countries. Their application in Uzbekistan is discussed further in Section 2.3.

2.3. **The need to diversify the sources for municipal finance and legislative gaps**

According to the American Society of Civil Engineers, the deficit of funding in the infrastructure during 2006-2010 was US$ 1.6 trillion in the USA, $ 843 billion in Germany, $ 250 billion in India, $ 125 billion in Canada, and $ 128 billion in Ireland. In the EU, infrastructure financing constitutes
about $1 trillion. In many countries, the majority of infrastructure assets are owned by the government and municipalities. Transfer of their ownership into private hands is often not considered advisable due to social and political reasons and given high risks. Yet, the limited state and municipal budgets and increasing social liabilities of the authorities are behind low growth, and sometimes, reduced expenditure on infrastructural needs. The development and utilization of an institutional system involving private sector in the construction and operation of infrastructural objects, known as Public-Private Partnership (PPP) became a solution in the situation that is prevailing in the infrastructural sector. Through PPP, the state authorizes the private sector to manage its property, while the latter benefits from state guarantees and brings in its organizational experience, expertise and investments.

Uzbekistan is yet to adopt a law on public-private partnership. Nevertheless, the regulatory and legal framework is built in laws concerning privatization, restructuring and regulating natural monopolies, the development of competition, introduction of leasing, and foreign investments. However, to establish an efficient mechanism for involving private businesses in the implementation of infrastructural projects, the following laws and subordinate acts need to be revised:

- **The Law “On Concessions” (1995)** has considerable flaws. It has not been applied from the time of adoption due to the lack of an entire range of standard requirements (norms and objects of agreements, distribution of risks, forms and methods of financing, etc.). Its practical application in its current form does not appear possible.

- **The Law “On Natural Monopolies”** does not provide for sufficient opportunities for the State Committee on Demonopolization, Support for Competition and Entrepreneurship to have an impact on natural monopolies, and first of all, on city infrastructure players. The main issue is that the regulation of tariffs of natural monopolies, such as water supply and sewage, heat supply, collection and disposal of RSW, electricity supply, gas supply, etc. is implemented by the Ministry of Finance and its regional bodies.

The implementation of Uzbekistan’s strategy for modernizing and accelerated industrial development during the next 10-15 years will inevitably increase the concentration of industrial enterprises in cities, the urban population, capital construction, including residential and public recreational facilities. These processes will be taking place against decreasing water and resources, and growth in the cost of materials. All of this becomes a challenge for the city infrastructure. The present-day urban infrastructure does not have sufficient capacity for painless absorption of a large influx of population from rural areas and satisfaction of growing demand for infrastructural services.

The main obstacles are the borders of the facilities producing water, sewage, heat, electricity, etc., and low efficiency of the city infrastructure. For instance, the wear and tear of the water grid in cities and urban-type settlements increased from 27% in 1995 to 39% in 2009. In absolute numbers, the length of water grids has increased (1,471km launched in 1995; 2,899km launched in 2009).

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11 PPP does not always lead to success. During the past 20 years, in the area of water supply and sewage in foreign countries, over 11% of PPP projects, which accounted for 36% of total investments into the sector, were stopped or had their contracts considerably revised. One of the scandalous PPP projects was a water supply project in Atlanta City (USA). 20 year old water supply concession was awarded to United Water Resources, in 1999. It committed to invest $800 million into the development of water supply system of the city during 5 years. However, within three years, the situation with water supply in the city had deteriorated. The company promised to invest $20 million per annum into the project; however, it only invested $10 million each year, attributing the reduction in subsidies to the fact that the operating company received excessive income from the operation of $33 million per year. In 2003, the concession was annulled. The water supply system was returned to the city municipality.

However, the ratio of newly launched lines to the total length of the grid reduced from 47% in 1995 to 42% in 2009. During the last five years, the wear and tear of the sewage remains the same at 20%. However, if in 1996, about one fifth of the pipelines requiring renovation were replaced, in 2009 this number was only 1%. During 1996-2009, the total length of heat supply networks reduced by 16%, with the share of completely exhausted parts was 19% in 2009 versus 5% in 1996. The construction and reconstruction of heat supply networks has reduced. For example, in 1996, about 22km of heat supply networks were built, while in 2009 it was only 1km. Overall, the urban infrastructure system’s development is following a downward line in terms of its maximum capacity.

There is no doubt that the maintenance and further development of city infrastructure requires long-term investments. At the same time, while the government is allocating significant funds towards the development of urban infrastructure, it remains to be the “weak link” in the economic development. The system remains inefficient in structural, financial and economic, and more importantly, in the institutional respects. Hence the root cause of the mentioned system issues lies in the inconsistent role and practical mechanisms for the participation of local authorities in the planning, construction, reconstruction and maintenance of infrastructure. In other words, the main institutional reason behind a weak city infrastructure is the inconsistency of the local administration system, lack of authority and weak institutional mechanisms for state regulation at local levels.

Administration of cities (Khokimiats), being responsible for the satisfaction of growing needs of the urban population in infrastructural services, should play a key role in forming the system of city infrastructure management.

Given the stated, it appears that the priority task in improving the policy of managing urban infrastructure, liquidating the disparity between the capacity of the city infrastructure (supply) and the requirements of the demographic growth, migration and urbanization (demand) is to resolve the outstanding issues concerning the increase in the scope, rights and authority of administration (khokimiats), to improve the regulatory and legal base for their operations, to improve financing mechanisms (primarily through increasing the opportunities for local budgets to fund infrastructural projects in cities), to enhance the coordination between all participants of the process of developing infrastructural sectors, and to examine and develop recommendations to ensure accelerated development of infrastructural sites.
3 URBAN POLICY AND MANAGEMENT

3.1. Urban Policy

The efforts of the government of the Republic of Uzbekistan have lately been concentrated on large infrastructure reconstruction and development projects in the cities of Tashkent, Samarkand, Andijan, Namangan, Fergana, Margilan, Kokand and others. In addition to this, pursuant to the Cabinet of Ministers Resolution No. 68 (from March 13, 2009), “On Additional Measures for Improving the Administrative and Territorial Structure of Settlements of the Republic of Uzbekistan," government bodies started carrying out social, economic and legal activities in relation to the change in the category of settlements, observing town-planning requirements set for urban-type settlements. In 2009, 965 villages with total population of 4.4 million people were given the status of urban-type settlements.

3.2. Urban Planning

In the 2005-2010 a series of comprehensive programs were implemented with the aim to achieve accelerated development of infrastructure, transport and communications and enhance the scope of city services. In particular, programs were implemented in the cities of Tashkent, Samarkand, Bukhara, Ferghana, Andijan, Namangan, Margilan, Kokand etc.

The strategy of urban planning was improved in general and, in particular, several amendments were made in the body of legislation of the Republic of Uzbekistan. Among these, it is worth to mention in particular, the decrees of the President of the Republic of Uzbekistan related to modernization, technical and technological renovation of key industries, infrastructure development, transport and communication, improved water supply, gas, electricity, sanitation in the cities and townships.

The policy of the Government of Uzbekistan related to urbanization is governed by the following laws:
4. Law on Waste Management (2002). This law was changed and amended (see Oliy Majlis Newsletter, 2002, No. 4-5, p. 72; 2003, No. 5, p. 67, No. 9-10, p. 149; Collected Legislation of the Republic of Uzbekistan, 2007, No. 50-51, art. 512).
5. The Urban Planning Code of the Republic of Uzbekistan 4.04.2002 #353-II. This Code stipulates the rules and regulations of urban development. It defines the objects of urban planning and the powers of state authorities, and stipulates the rules for the inventory, planning and development of territories and their proper use.

3.3. Urban management
The main task in the management of any city is to provide for a balanced development in two major areas: the city-forming area, oriented towards the development of a specific territory, and the city-serving area, the goal of which is to provide for the essential needs of such territory and its population, with resources, goods and services. An urban management system includes a number of purpose-specific, functional and provisionary subsystems, with set goals and tasks. The urban infrastructure is a vital part of the latter. In the majority of cities the gap between supply and demand for infrastructure services is growing rapidly. A number of factors lie behind this, including:

- **First of all**, as already mentioned, the system of financing the city infrastructure has very little to do with local authorities and is hardly tied to the local budgets.

- **Secondly**, inadequate infrastructure pushes the small businesses to relocate to region centers and to the city of Tashkent, which then affects the income part of local budgets and the employment opportunities for local population. In a manner of a vicious circle, the insufficient funding allocated by local budgets causes the infrastructure capacity to fall.

- **Thirdly**, as a result of reforming the utilities sector, the functions of republican bodies that are in charge of the development strategy for water supply, sewage, heat supply, and managing Residential Solid Waste (RSW), underwent significant changes.
  
  - "UzKommunHizmat" Agency is focused exclusively on major interregional drinking water pipelines. State agencies for water supply, sewage, and central heat supply, except for departmental ones, are turned over to local government authorities.
  
  - At the same time, the city and district authorities lack an efficient mechanism for coordinating infrastructural entities (Appendix 1). Such authorities (except for Tashkent City Administration) do not have a Department responsible for infrastructural development within their structures.

### Table 4: Scope of authority of various institutions in urban infrastructure management

<table>
<thead>
<tr>
<th>Institution</th>
<th>Scope of Authority</th>
<th>What is missing</th>
</tr>
</thead>
<tbody>
<tr>
<td>City Authorities (Khokimiat)</td>
<td>Develops local budget proposals in terms of expenditure for the maintenance, repair and reconstruction of water supply, sewage, heat supply, RSW collection, transportation and disposal sites, and municipal improvement. All listed entities, with the exception of the city improvement department/administration - independent quasi commercial entities, and local budget’s support there to is limited.</td>
<td>City authorities do not have sufficient financial resources for maintaining, reconstructing and repairing infrastructure sites. In addition to budgetary issues, there are also operational, administrative, and legal limitations, as nearly all listed establishments are independent and fully commercial entities (usually with outstanding receivables and payables). City authorities have no right (as well as opportunities) for raising debt with the purpose of developing the aforementioned infrastructure sites. Usually authorities do not interfere with the commercial activities of specified entities, as they have no right to do so. City authorities (except Tashkent and Samarkand city Administration) have no structural units to deal with municipal infrastructure; some even lack appropriate staff members.</td>
</tr>
<tr>
<td>Region (Oblast) Authorities</td>
<td>Provides, to the extent possible, financial support to city infrastructure development.</td>
<td>As above</td>
</tr>
<tr>
<td>(Khokimiat)</td>
<td>projects based on the requests of City authorities, dealing with water supply, sewage, heat supply, RSW collection, transportation and disposal. Reviews and takes a decision related to city authorities’ proposals on gas and electricity supply, agreed upon with regional administrations of “UzTransGas” JSC and oblast units of “UzbekEnergo” SJC. “UzKommunHizmat” Agency is the successor of the Ministry of Utilities, and has a limited scope of authority. As a result, municipal water supply, sewage, heat supply, utilities, improvement, RSW collection and disposal and other entities are left without an oversight of a central state administration body.</td>
<td></td>
</tr>
<tr>
<td>---</td>
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<td></td>
</tr>
<tr>
<td>The Agency’s scope of authority is limited to the management of interregional water main network, and provision of technical assistance and information to water supply and sewage operators. The Agency does not directly participate in forming budgetary or any other programs to develop city water supply and sewage systems. Upon the instruction of the Cabinet of Ministers, the Agency can participate in the implementation of municipal water supply and sewage reconstruction projects, with the financing coming from loans and/or grants of foreign countries and International financing institutions (IFIs). Upon the instruction of the Cabinet of Ministers, the Agency organizes the collection of information on the condition of water supply and sewage sites, usually through region authorities (khokimiat). “UzTransGas” JSC Organization of natural gas supplies based on the approved requests of authorities of various cities, oblasts, and the Karakalpakstan, for the potential inclusion in annual and/or medium-term plans, to be agreed upon with the Ministry of Finance, Ministry of Economy and the Cabinet of Ministers. Participates in the preparation and implementation of targeted programs for the construction and reconstruction of municipal gas supply sites, within the frameworks of Presidential Decrees and resolutions of the Cabinet of Ministers. Organizing of municipal gas supply and gasification is not a good fit for “UzTransGas” JSC, as it is only responsible for the receipt, transportation and wholesale distribution of natural gas.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>“UzbekEnergo” SJC Compiles proposals for electricity supply based on the approved requests of authorities of various cities, oblasts, and the Republic of Karakalpakstan, for the potential inclusion in annual and/or medium-term plans of the SJC, to be agreed upon with the Ministry of Finance, Ministry of Economy and the Cabinet of Ministers. Participates in the preparation and implementation of special programs for the construction and reconstruction of municipal electricity supply sites, within the frameworks of Presidential Decrees and resolutions of the Cabinet of Ministers. “UzbekEnergo” SJC is responsible for the construction and operation of large generation plants and the supply of electric energy. The development and improvement of municipal electricity supply systems require a more flexible and systemic approach.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

“UzTransGas” JSC and “UzbekEnergo” SJC could limit their scope of authority to the supply of natural gas and electric power, respectively, up to city borders, and to wholesale distribution of the
resources to authorized bodies, as appointed by city authorities. “UzKommunHizmat” Agency, “UzTransGas” JSC and “UzbekEnergo” SJC do not initiate the development of medium- and long-term city infrastructure development programs, which reduces their efficiency at the local level.

It was demonstrated that the scopes of authority and the responsibilities of local state authorities in terms of infrastructure, are limited. In particular:

- no systematized information on the condition and key problems of city infrastructure is available in local state authorities;
- city authorities (khokimiats) do not have a real opportunity to review the state of heat, electricity, and water supply and sewage, whether independently or by attracting independent auditors. There is no proper control or coordination of activities of entities operating in this industry. The implementation of government resolutions on infrastructure development and improvement of utility services is hardly monitored;
- in oblast (regional) and republican statistics small and medium-sized towns are “diffused” by districts, which makes it impossible to analyze the state of infrastructure and to plan the development of such towns;
- no energy- and resource-conserving programs of comprehensive infrastructure development are being developed;
- there is little attention paid to the infrastructure-related needs of small and private businesses. Not a single city (except for Sergeli District of Tashkent City) has a simplified procedure for connecting small businesses to utility services via a "One-Stop Solution";
- there are no programs for developing healthy competition: the steps that are taken to expand the access of private sector to the utilities market, are insufficient;
- there is no comprehensive analysis of causes and circumstances of defaults in payment for supplied utilities. No forms of formal action towards non-payers and violators of the rules of using utilities are being developed or applied;
- there are practically no seminars introducing best international practices to utility workers, e.g. on energy efficient technologies, technologies for detecting and preventing failures in the grids.

The inadequacy of the mechanisms of managing city infrastructure and high dependence of the industry on republican funding are obstacles on way of achieving the levels of development that are desired for a modern city with sustainable infrastructure services. Hence, forming an organizational structure for managing city infrastructure is a priority task at the current stage of adapting city management entities to the market economy (see Recommendations).

The trends of demographic growth and human migration in the Republic of Uzbekistan and growing industrial capacity call for an optimization in the city management system. With an increase in the role and responsibility of local authorities in forming and administering local budgets, as well as for wide application of best practices employed by developed countries in infrastructure policies and management. In this regard it is critical to evaluate the condition of the city infrastructure, establish the main reasons for falling behind and determine main directions for an accelerated development of its capacity.
4.1. Electricity

In 2010, total aggregate generated electric power in the Republic of Uzbekistan constituted 51.95 billion kW/hour (during the last ten years this number increased by 4.05 billion kW/hour), while the number of transformer substations reached 63,840 (see Table 5 and Table 6). The positioning of main generating facilities of "UzbekEnergo" SJC ensures uninterrupted electricity supply to Tashkent City and the majority of large cities. In the regions however, the growing demand for electricity in the regions is not met in full. Nearly in all 16 cities, listed in Table 6, the stated aggregate capacity of electricity supply is very close to the resource potential. Moreover, in the survey of 3,000 households and employers in 45 districts of Uzbekistan, 48% of respondents stated that the electricity is supplied with interruptions.

Table 5: Electricity Supply Development Dynamics

<table>
<thead>
<tr>
<th></th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011 forecast</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aggregate electricity generation (billion kWh)</td>
<td>47.9</td>
<td>49.3</td>
<td>48.7</td>
<td>49.7</td>
<td>47.6</td>
<td>49.37</td>
<td>49.01</td>
<td>50.15</td>
<td>50.06</td>
<td>51.95</td>
<td>51.7</td>
</tr>
<tr>
<td>Length of main lines (km) 220 kV</td>
<td>225.6</td>
<td>225.6</td>
<td>225.6</td>
<td>249.0</td>
<td>249.0</td>
<td>249.0</td>
<td>249.0</td>
<td>249.0</td>
<td>249.0</td>
<td>255.0</td>
<td></td>
</tr>
<tr>
<td>Length of cable lines (km) 35-110 kV</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>297.3</td>
<td>300.1</td>
<td>300.1</td>
<td>300.1</td>
<td>300.1</td>
<td>300.1</td>
<td>302.1</td>
<td>302.1</td>
</tr>
<tr>
<td>Length of distribution lines (thousand km)</td>
<td>196.5</td>
<td>196.7</td>
<td>197.4</td>
<td>198.8</td>
<td>300.7</td>
<td>301.3</td>
<td>201.8</td>
<td>201.9</td>
<td>202.4</td>
<td>203.8</td>
<td>204.5</td>
</tr>
<tr>
<td>Number of transformer substations (TS)</td>
<td>58695</td>
<td>58797</td>
<td>59230</td>
<td>60209</td>
<td>61886</td>
<td>62136</td>
<td>62500</td>
<td>63003</td>
<td>63353</td>
<td>63840</td>
<td>64040</td>
</tr>
<tr>
<td>Electricity loss (billion kWh)</td>
<td>5.1</td>
<td>6.9</td>
<td>7.7</td>
<td>8.37</td>
<td>8.89</td>
<td>8.05</td>
<td>6.81</td>
<td>6.75</td>
<td>7.3</td>
<td>7.35</td>
<td>7.59</td>
</tr>
<tr>
<td>Aggregate use of electricity (billion kWh)</td>
<td>9.9</td>
<td>10.68</td>
<td>11.07</td>
<td>11.72</td>
<td>10.52</td>
<td>9.04</td>
<td>9.3</td>
<td>10.02</td>
<td>9.97</td>
<td>10.14</td>
<td>-</td>
</tr>
<tr>
<td>Electricity tariff for the population (soum per 1kWh)</td>
<td>6.50</td>
<td>10.30</td>
<td>16.80</td>
<td>27.10</td>
<td>34.50</td>
<td>38.00</td>
<td>43.70</td>
<td>60.40</td>
<td>64.80</td>
<td>76.80</td>
<td>83.60</td>
</tr>
</tbody>
</table>

Source: “UzbekEnergo” SJC

Table 6: Dynamics of Electricity Consumption in Certain Cities of Uzbekistan (million kWh/hour)

<table>
<thead>
<tr>
<th>City</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>Forecast for 2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Samarkand</td>
<td>645</td>
<td>554.4</td>
<td>660.2</td>
<td>578.4</td>
<td>446.2</td>
<td>395.4</td>
</tr>
<tr>
<td>Namangan</td>
<td>245</td>
<td>206.8</td>
<td>276.0</td>
<td>235.1</td>
<td>275.9</td>
<td>222.3</td>
</tr>
<tr>
<td>Bukhara</td>
<td>218</td>
<td>148.7</td>
<td>228.6</td>
<td>166.4</td>
<td>266.5</td>
<td>219.1</td>
</tr>
<tr>
<td>Andijan</td>
<td>371</td>
<td>327.2</td>
<td>530.1</td>
<td>501.6</td>
<td>528.7</td>
<td>492.6</td>
</tr>
<tr>
<td>Nukus</td>
<td>168</td>
<td>157.5</td>
<td>161.3</td>
<td>149.1</td>
<td>170.1</td>
<td>148.1</td>
</tr>
<tr>
<td>Gulistan</td>
<td>107</td>
<td>98.7</td>
<td>98.4</td>
<td>91.2</td>
<td>101.1</td>
<td>91.8</td>
</tr>
<tr>
<td></td>
<td>2006</td>
<td>2007</td>
<td>2008</td>
<td>2009</td>
<td>2010</td>
<td>Forecast for 2011</td>
</tr>
<tr>
<td>--------</td>
<td>------</td>
<td>------</td>
<td>------</td>
<td>------</td>
<td>------</td>
<td>-------------------</td>
</tr>
<tr>
<td>Djizak</td>
<td>295</td>
<td>259.1</td>
<td>313.5</td>
<td>276.7</td>
<td>300.5</td>
<td>328.4</td>
</tr>
<tr>
<td>Navoi</td>
<td>38</td>
<td>34.0</td>
<td>36.7</td>
<td>32.8</td>
<td>36.8</td>
<td>43.3</td>
</tr>
<tr>
<td>Karshi</td>
<td>321</td>
<td>268.0</td>
<td>347.0</td>
<td>287.8</td>
<td>324.8</td>
<td>331.0</td>
</tr>
<tr>
<td>Kokand</td>
<td>170</td>
<td>144.3</td>
<td>195.6</td>
<td>164.4</td>
<td>210.2</td>
<td>224.8</td>
</tr>
<tr>
<td>Urgench</td>
<td>174</td>
<td>153.9</td>
<td>167.2</td>
<td>149.1</td>
<td>173.2</td>
<td>178.1</td>
</tr>
<tr>
<td>Chirchik</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1049.8</td>
<td>993.4</td>
</tr>
<tr>
<td>Khiva</td>
<td>114</td>
<td>99.3</td>
<td>124.1</td>
<td>109.4</td>
<td>126.5</td>
<td>129.8</td>
</tr>
<tr>
<td>Termez</td>
<td>140</td>
<td>119.8</td>
<td>132.5</td>
<td>117.1</td>
<td>128.2</td>
<td>139.8</td>
</tr>
<tr>
<td>Tashkent</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>403.7</td>
</tr>
<tr>
<td>Fergana</td>
<td>224</td>
<td>189.0</td>
<td>238.4</td>
<td>199.7</td>
<td>245.3</td>
<td>238.8</td>
</tr>
</tbody>
</table>

Source: "UzbekEnergo" SJС

The following problems are behind the poor performance of the industry:

1. **Inadequacy of the technical condition and equipment of "UzbekEnergo" subdivisions.** The rate at which the installed capacity is increased and the capacity of industry enterprises is lagging behind the needs dictated by the growth in urbanization and industrial potential of the cities. Actual losses of electric power in the transmission and distribution networks of Uzbekistan are nearly 4 times higher than the same in the USA, Japan and Germany; 2.8 times higher than in Italy and France; and 2.4 times higher than in Great Britain and Canada. According to expert forecasts, in 2011, electricity losses in the RoU are expected to reach 7.59 billion kWhour, which is 150% more than in 2001.

2. **Low efficiency of the system of reporting and controlling electric energy consumption**. This problem results primarily in large and increasing problems with receivables at "UzbekEnergo" SJС. Namely, as of April 1, 2011, total payables of consumers for supplied electricity, including overdue payables is 224 times more than the same figure for 2001.

### 4.2. Gas supply

As of the beginning of 2011, the length of city gas pipelines was 124,897 km. During the last 15 years, about 2,717 km of gas networks were commissioned in the country's cities and settlements. The number of individual consumers of natural gas reached 4,345,559 (having increased by 342,433 during the last 4 years), see Table 7.

As shown in Table 8, the cities of Tashkent, Bukhara, Djizak and Khorezm regions have high natural gas consumption rates. At the next level are cities of the Republic of Karakalpakstan, Andijan, Syrdarya and Samarkand regions. At the same time, a relatively low consumption rates are noted in Surkhandarya, Navoi, Fergana and Kashkadarya regions. In 2010, almost in all cities, except Djizak, Namangan, Andijan and Karshi, gas supply volumes fell against 2005 numbers. According to "UzTransGas," in 2010, natural gas losses amounted to 501,166 thousand m³, which is 44,999 thousand m³ less than in 2009. This is still high by international standards. Natural gas losses are mainly caused by poor condition of the networks (resulting in losses in transportation and distribution). There are however problems also with the reporting: the 2009–2011 inspections of gas

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13. The Resolution of the Cabinet of Ministers No. 150, dated June 5, 2009 "On Additional Measures to Improve the System of Reporting and Controlling Electric Energy Consumption," provides for the following: (a) installation of automatic systems for reporting and controlling electric energy consumption at "UzbekEnergo" CJSC enterprises during 2009-2011; and (b) installation of modern electronic electricity meters at businesses and individual households, as part of automatic systems for reporting and controlling electric energy consumption, during 2009-2011. Starting from July 1, 2009, "UzbekEnergo" SJС, "UzGosEnergoNadzor," and "GosArchitectStroy," jointly with respective ministries and departments approve completed construction objects only after equipping them with modern electronic devices and systems for reporting electricity consumption.
meters, installed in houses and apartments, revealed that almost all devices manufactured by an Uzbek-Chinese JV, failed to meet the technical standards of the Republic of Uzbekistan.

Table 7: General Information about Gas Supply

<table>
<thead>
<tr>
<th></th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length of city gas network (km)</td>
<td>118,035</td>
<td>120,525</td>
<td>122,627</td>
<td>123,914</td>
<td>124,897</td>
</tr>
<tr>
<td>Losses (in thousand m³)</td>
<td>954,721</td>
<td>616,739</td>
<td>556,864</td>
<td>546,156</td>
<td>501,166</td>
</tr>
<tr>
<td>Individual consumers of natural gas</td>
<td>4,003,126</td>
<td>4,112,141</td>
<td>4,184,780</td>
<td>4,270,621</td>
<td>4,345,559</td>
</tr>
<tr>
<td>City consumers' payables for supplied gas (million soum)</td>
<td>347,136.5</td>
<td>526,745.2</td>
<td>756,307.5</td>
<td>1,127,198.4</td>
<td>1,559,731.1</td>
</tr>
</tbody>
</table>

*Source: "UzTransGas" JSC*

Table 8: Dynamics of City Gas Supply (per 1 resident, in thousand m³/year)

<table>
<thead>
<tr>
<th></th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Karakalpakstan</td>
<td>0.738</td>
<td>0.719</td>
<td>0.888</td>
<td>0.774</td>
</tr>
<tr>
<td>Andijan Oblast</td>
<td>0.903</td>
<td>0.804</td>
<td>0.806</td>
<td>0.779</td>
</tr>
<tr>
<td>Bukhara Oblast</td>
<td>1.007</td>
<td>0.928</td>
<td>1.112</td>
<td>0.920</td>
</tr>
<tr>
<td>Djizak Oblast</td>
<td>0.893</td>
<td>0.873</td>
<td>0.967</td>
<td>0.894</td>
</tr>
<tr>
<td>Kashkadarya Oblast</td>
<td>0.791</td>
<td>0.745</td>
<td>0.747</td>
<td>0.704</td>
</tr>
<tr>
<td>Navoi Oblast</td>
<td>0.538</td>
<td>0.521</td>
<td>0.645</td>
<td>0.612</td>
</tr>
<tr>
<td>Namangan Oblast</td>
<td>0.762</td>
<td>0.723</td>
<td>0.784</td>
<td>0.735</td>
</tr>
<tr>
<td>Samarkand Oblast</td>
<td>0.893</td>
<td>0.742</td>
<td>0.839</td>
<td>0.759</td>
</tr>
<tr>
<td>Syrdarya Oblast</td>
<td>0.841</td>
<td>0.809</td>
<td>0.824</td>
<td>0.770</td>
</tr>
<tr>
<td>Surkhandarya Oblast</td>
<td>0.416</td>
<td>0.413</td>
<td>0.381</td>
<td>0.358</td>
</tr>
<tr>
<td>Tashkent Oblast</td>
<td>1.398</td>
<td>1.382</td>
<td>1.420</td>
<td>1.301</td>
</tr>
<tr>
<td>Fergana Oblast</td>
<td>0.807</td>
<td>0.752</td>
<td>0.763</td>
<td>0.695</td>
</tr>
<tr>
<td>Khorezm Oblast</td>
<td>0.820</td>
<td>0.826</td>
<td>0.844</td>
<td>0.760</td>
</tr>
<tr>
<td>Tashkent City</td>
<td>0.982</td>
<td>0.999</td>
<td>1.004</td>
<td>0.940</td>
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<tr>
<td>Republic of Uzbekistan</td>
<td>11.789</td>
<td>11.237</td>
<td>12.025</td>
<td>10.998</td>
</tr>
</tbody>
</table>

*Source: "UzTransGas" JSC*

Table 9: Dynamics of Gas Supply in Certain Cities (million m³)

<table>
<thead>
<tr>
<th></th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tashkent</td>
<td>3,390.4</td>
<td>3,308.7</td>
<td>3,511</td>
<td>3,504</td>
<td>3,453</td>
<td>3,307</td>
</tr>
<tr>
<td>Samarkand</td>
<td>685.0</td>
<td>640.1</td>
<td>616.7</td>
<td>593.3</td>
<td>675.3</td>
<td>614.1</td>
</tr>
<tr>
<td>Namangan</td>
<td>454.4</td>
<td>437.1</td>
<td>423.4</td>
<td>451.0</td>
<td>484.0</td>
<td>486.7</td>
</tr>
<tr>
<td>Fergana</td>
<td>286.2</td>
<td>334.3</td>
<td>355.7</td>
<td>323.0</td>
<td>295.6</td>
<td></td>
</tr>
<tr>
<td>Bukhara</td>
<td>315.9</td>
<td>287.2</td>
<td>302.9</td>
<td>264.8</td>
<td>312.2</td>
<td>304.9</td>
</tr>
<tr>
<td>Andijan</td>
<td>492.1</td>
<td>534.8</td>
<td>525.9</td>
<td>492.2</td>
<td>559.9</td>
<td>565.7</td>
</tr>
<tr>
<td>Nukus</td>
<td>310.9</td>
<td>326.3</td>
<td>310.0</td>
<td>309.9</td>
<td>292.7</td>
<td>274.7</td>
</tr>
<tr>
<td>Gulistan</td>
<td>119.0</td>
<td>111.6</td>
<td>125.7</td>
<td>138.1</td>
<td>139.4</td>
<td>136.2</td>
</tr>
<tr>
<td>Dzijak</td>
<td>160.2</td>
<td>207.7</td>
<td>218.2</td>
<td>227.3</td>
<td>224.6</td>
<td>228.6</td>
</tr>
<tr>
<td>Navoi</td>
<td>54.2</td>
<td>64.6</td>
<td>63.6</td>
<td>59.9</td>
<td>86.0</td>
<td>88.0</td>
</tr>
<tr>
<td>Karshi</td>
<td>251.9</td>
<td>241.8</td>
<td>269.5</td>
<td>284.7</td>
<td>295.6</td>
<td>283.9</td>
</tr>
<tr>
<td>Kokand</td>
<td>292.4</td>
<td>301.9</td>
<td>297.9</td>
<td>317.6</td>
<td>314.6</td>
<td></td>
</tr>
<tr>
<td>Urgench</td>
<td>236.3</td>
<td>236.1</td>
<td>233.0</td>
<td>224.7</td>
<td>208.6</td>
<td>209.0</td>
</tr>
<tr>
<td>Chirchik</td>
<td>148.4</td>
<td>153.8</td>
<td>152.4</td>
<td>144.9</td>
<td>148.2</td>
<td></td>
</tr>
<tr>
<td>Khiva</td>
<td>197.4</td>
<td>163.9</td>
<td>151.1</td>
<td>147.7</td>
<td>151.5</td>
<td>150.6</td>
</tr>
<tr>
<td>Termez</td>
<td>76.4</td>
<td>82.9</td>
<td>85.3</td>
<td>86.3</td>
<td>75.9</td>
<td>72.5</td>
</tr>
</tbody>
</table>

*Source: "UzTransGas" JSC*
Table 10: Dynamics of Installing Gas Service in Certain Cities (number of gas-supplied apartments)

<table>
<thead>
<tr>
<th></th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Namangan</td>
<td>75,565</td>
<td>76,941</td>
<td>78,865</td>
<td>80,724</td>
</tr>
<tr>
<td>Samarkand</td>
<td>104,593</td>
<td>104,552</td>
<td>105,630</td>
<td>105,578</td>
</tr>
<tr>
<td>Tashkent</td>
<td>558,879</td>
<td>561,732</td>
<td>562,507</td>
<td>565,223</td>
</tr>
<tr>
<td>Nukus</td>
<td>47,131</td>
<td>47,834</td>
<td>48,956</td>
<td>50,078</td>
</tr>
<tr>
<td>Kokand</td>
<td>44,813</td>
<td>48,776</td>
<td>48,950</td>
<td>49,071</td>
</tr>
<tr>
<td>Karshi</td>
<td>44,140</td>
<td>47,122</td>
<td>47,801</td>
<td>48,619</td>
</tr>
<tr>
<td>Termez</td>
<td>19,766</td>
<td>23,310</td>
<td>23,310</td>
<td>24,320</td>
</tr>
<tr>
<td>Chirchik</td>
<td>45,578</td>
<td>45,622</td>
<td>45,775</td>
<td>45,853</td>
</tr>
<tr>
<td>Kagan</td>
<td>21,187</td>
<td>21,220</td>
<td>21,622</td>
<td>23,082</td>
</tr>
<tr>
<td>Kattakurgan</td>
<td>21,200</td>
<td>21,200</td>
<td>21,200</td>
<td>26,683</td>
</tr>
<tr>
<td>Kungrad</td>
<td>20,739</td>
<td>20,739</td>
<td>20,502</td>
<td>20,916</td>
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<tr>
<td>Angren</td>
<td>6,463</td>
<td>9,974</td>
<td>15,054</td>
<td>16,183</td>
</tr>
</tbody>
</table>

Source: "UzTransGas" JSC

This industry faces problems that are similar to those in the electricity supply.

1. **Inadequacy of the technical condition and equipment of "UzTransGas" JSC subdivisions.** Every year, the Government invests large amounts of money into city and UTS gas supply development projects, and this occurs while the technological and technical level of gas supply entities is yet to meet new requirements. The system of feeding, transporting, distributing, reporting and controlling natural gas supplies remains costly and non-transparent. The industry services do not have modern technical means for remotely detecting and preventing large leaks and unauthorized natural gas intakes.

2. **Low efficiency of the system of reporting and controlling gas consumption.** Despite the fact that starting from 2009, all major cities and UTS are checking the technical condition of gas meters, discarding faulty meters and replace these with improved devices, the trend of unauthorized/unpaid usage of gas by consumers continues, leading to further increase in payables for supplied gas. Thanks to the installation of meters and improved controlling and reporting of gas consumption in 2010, natural gas losses were successfully reduced by half compared to 2006.

### Box 2. Financing of city gas/electricity supply organizations

- **I.** Subscribers pay for natural gas/electricity to bank accounts of oblast subdivisions;
- **II.** The volume of supplied energy resources is checked against money received for services that have already been rendered;
- **III.** Oblast gas/electricity supply organizations transfer the money received from consumers to the accounts of parent companies - "UzTransGas" and "UzbekEnergo", respectively;
- **IV.** Parent organizations transfer money to city gas/electricity supply organizations for salaries, and normally about 10% for incidentals.

3. **Inadequacy of the management system of gas supply enterprises.** In the city gas supply system, as well as electricity supply system, local enterprises are mainly fulfilling the functions of selling energy and controlling the status of consumer connections to the grid. Materials and auxiliary tools for current repairs and maintenance are allocated by the state owned companies at the central level based on requests of local subdivisions. They are also responsible for the maintenance of the grid and transmitting devices, and carry out routine repairs. City electricity supply by state electricity companies are in charge of compliance with payment discipline, organizing the reporting of consumption, collecting payments and overdue payables for provided services (Appendix 7). "UzTransGas" and "UzbekEnergo" carry out all of the capital repairs of the grids on their own. The appointment and dismissal of heads of the mentioned city organizations is the
authority of the parent departments and/or oblast organizations, with the agreement of the city governor (khokim). However, city authorities do not have real financial or economic leverage to impact and improve the efficiency of energy suppliers.

4.3. Heat Supply

The system of central heat supply (CHS) of the country was formed as early as 1950-1970s and is available in 29 cities. As of April 1, 2011, the total length of heat supply networks in the country is about 5,000 km (of which over $\frac{1}{3}$ are technically unserviceable). During 1996-2009, total length of heat supply grids in the cities reduced by 16%. If in 1996, cities had 22 km of heat supply grids; in 2009 this number was 1 km (see Figure 3 and Figure 4).

As of the beginning of 2011, the country had 2,300 boiler-stations with total installed capacity of 6,544.0 Gcal/hour. 78% of the country’s thermal power is generated in Tashkent.

The country’s central heat supply system is in poor condition, which is directly related to the following problems (Appendix 3):

1. Excessive cost of producing, transmitting and selling heat energy. Heat energy is produced from natural gas (80.6%), coal (13.3%) and oil (6.1%). A vast majority of heat supply systems operates with waste of fuel, electric power and circulation water. For instance, natural gas used to generate 1 Gcal of thermal power exceeds established norms by 1.5 times, while consumption of energy resources per person in Uzbekistan exceeds average European numbers by 2.5 times for heat and by 1.8 times for water. In many ways this

\[14\] Certain Heat Supply companies are wholesale traders of heat energy, supplied by "UzbekEnergo" and departmental boiler-stations.
is due to the fact that ⅔ of boilers are operated with maximum wear and low Performance Factor (PF) (about 68%). Despite the fact that the government of the RoU invests large amounts of money to repair and maintain Central Heat Supply (CHS) during a number of years nothing was done locally to introduce energy-conservation technologies. Most of individual and central heat units are not automated. Due to lack of funds for repair and upgrade, only in 2007-2008, 1,000 boiler-stations were dismantled throughout the country. Local heat supply sources, installed in some cities as an experiment, so far have not been validated and are yet to demonstrate their advantages. The wear-and-tear of building utility installations in the majority of apartment blocks prevent the provision of heat according to the norms. According to experts, nearly 50% of the heat escapes through inefficient windows, doors, ceilings and walls.

2. Insufficient financing of CHS system. Nearly 80% “Heat Supply Co.” entities have overdue payables\textsuperscript{15}. The population pays for the heat not per Gcal, but based on consumption norms. The tariffs do not rise in correspondence with the growing prices for energy or increasing costs of maintenance in the industry. In most cases the tariffs for heat are established based on costs. And all overhead expenses, as well as water and heat losses during transportation are imposed on the end consumers. The operations of CHS enterprises are directly dependent on the operation of electricity, fuel and water supply systems, which have their own complex issues. For example, in the cost of thermal power, the largest factors are gas (40%), electric energy (30%), and water (18%).

3. Problems in planning and organizing the operations of CHS systems. These problems periodically lead to disaccords between the supply schedule of “Heat Supply Co.” entities and heat energy consumption, especially off-season, resulting in numerous complaints from consumers. The management of “Heat Supply Co.”, as well as administrative structures represented by local authorities, due to various reasons, do not pay due attention to organizing the efficient and smooth operation of CHS.

On December 31, 2009, the Commission for Conserving Fuel and Energy Resources approved the Concept for Reforming Heat Supply System in the Republic of Uzbekistan (Minutes of the Meeting No.05/3-166). Main directions of reforms were determined as follows:

- Developing designs for heat supply in 29 major cities based on an inventory inspection of heat supplying entities and apartment buildings, and availability of hot water and heat meters for residential consumers;
- using gas turbine technologies, capital overhaul and replacement of obsolete boilers, transition to a closed heat supply system;
- capital overhaul and reconstruction of internal building utility installations, using systems of local heat supply;
- improving staff qualifications and training.

\textsuperscript{15} Financial model of “Heat Supply Co.” entities:

2. Regional “Heat Supply Co.” finances city “Heat Supply Co.” entities on the following items: a) cover payables for electricity, gas and water supply; b) wages and care; c) mandatory payments, etc.
These tasks are expected to be implemented by 2019, and are divided into 3 stages:
I-stage: 2010-2012
II-stage: 2013-2016
The cost of implementing the projects within the Concept is estimated at US$950 million. At the same time, the Concept fails to specify the source of funds (and terms of financing). If all the activities are to be funded from the republican budget, then it does not spell out the deadlines and mechanisms for ensuring the return of these funds. It is unclear how these investments will affect the tariffs for heat and hot water supply. The Concept does not address the financial and economic status of heat supply entities, which are close to bankruptcy. During 2012-2017, the main plan is to technically re-equip the industry, and in the end, to start improving the tariff policy and the economic sustainability of heat supplying entities. Thus the priority, as set out in the Concept is to attract considerable state funding without significant modernization of the management system and state regulation. It is absolutely clear that without changes in the CHS management system, state investments cannot provide expected results.

4.4. Water Supply

According to the State Statistics Committee of the RoU (SSC), the total length of water supply network in cities and UTS is 18,574 km (see Figure 5), while the length of decayed pipes is 2,051 km. Total production and supply of water in all cities and UTS taken together is not more than 763,922 thousand m³, and has fallen in the last ten years by 63,754 thousand m³.

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16 Nevertheless, as noted in the Concept, export of natural gas, saved while operating the CHS systems at $240 per thousand m³, will allow receiving an additional $ 258 million a year.
The trends in the water supply system appear to be caused by the following problems.

1. **Unsatisfactory technical condition of the water supply system.** According to "UzKommunHizmat" Agency, in 2010, city water supply systems registered 22,617 breakdowns. In the last ten years the wear of water distribution networks increased to 39%, while the average annual losses of drinking water totaled about 235 thousand m³. At the same time, the commissioning of new water distribution networks in the cities and/or replacement of worn parts did not meet the growing demands of the cities, including the capital city (Figure 6). During 2000-2009, on average, 10.5 km of new water pipelines were commissioned in Tashkent per year.

2. **Insufficient level of metering.** According to "UzKommunHizmat," as of May 1, 2011 only 44.6% individual subscribers have water consumption meters. As a result, over half of individual subscribers pay for Water Supply and Sewage (WSS) based on consumption norms. Water consumption norms are approved by the Resolution of the Cabinet of Ministers No.271 "On Approving Norms Due to Transition to Self-Sufficiency of Housing and Utility Services," dated July 30, 1996 with additions contained in CMR Nos. 74 (1997), 65 (1999), 74 (2001), 103 (2003), 127 (2005) and in the Resolution of the President of the Republic of Uzbekistan No. PP-532 dated December 18, 2006. Water consumption norms for domestic and drinking needs of the population are set based on the degree of available residential amenities (from 77 to 270 l/day). Payment for water supply based on consumption norms is not optimal, since the end user is not being interested in conserving the water, as he/she pays the bills based on consumption norms.
3. The current consumption norms do not provide incentives for water saving. According to the Resolution of the Cabinet of Ministers No.271 (from July 30, 1996) "On Approving Norms Due to Transition to Self-Sufficiency of Housing and Utility Services,” the loss allowance per capita in water consumption is 29.5%.

Water Supply and Sanitation Co. - "Suvokava” local subdivisions do not pay due attention to water consumption in apartment blocks where only malfunction of sanitary and technical equipment causes an average water loss of about 20%. The experience of municipal services in a number of Russian cities indicates that recording the water use in each apartment can stimulate water saving, with water consumption reducing almost by half. In addition to this, the approaches towards water saving have not changed much as well. For instance, for the purposes of the Resolution of the Cabinet of Ministers No.167 (from August 04, 2010), "On Approving the 2030 General Plan of the City of Kokand,” "UzShaharSozlikLoyiha" OJSC stipulated the norm of drinking water consumption per capita at 240 liter/day in 2015 and 267.7 liter/day in 2030. At the same time, many developed countries have long been working on reducing per capita consumption of drinking water to 120 liter/day by 2030.

4.5. Sewage

Figure 7: Commissioning Sewage Lines in Cities (km)

According to "UzKommunHizmat" Agency, sewage systems are available in 69 cities and settlements. The total length of sewage lines is 3,845 km. During 1995-2009, 732 km of sewage conduits were commissioned in various cities, including about 496 km in the city of Tashkent, which represents 68% of total sewage increase in the country (Figure 7).

At the same time, in some cities the provision of the population with sewage services is unsatisfactory. In the city of Samarkand almost 36% of the population does not have access to municipal sewage lines. The analysis of the operation of municipal sewage lines (in the context of united operation of water supply systems and sewage) leads to the identification of the following problems.

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1. **Insufficient technical support to WSS systems.** Its potential is lagging far behind the urbanization rates. Equipment and machinery deployed by the industry enterprises are largely worn out. The majority of sewage system network items are in operation for over 50 years. About 30% of wastewater collected in sewage pipes leaks through into the ground.

2. **Weak economic performance of the WSS system.** During the last few years, the industry enterprises are witnessing deterioration in their financial and economic performance (except for Tashkent City). As of April 1, 2011, receivables from individual subscribers increased 11-fold compared to 2000. The tariff policies, as well as production and financial operations of Water Supply and Sewage companies are not transparent, predictable or stable. Increase in tariffs does not cover real costs of water supply and effluent discharges. Water Supply and Sewage companies do not invest sufficient efforts in reducing losses or optimizing costs, in which energy and materials are the predominant components.

3. **Inadequacy of WSS enterprises management system to modern-day requirements.** Presently, city authorities do not have departments that would systemically and regularly administer water supply and sewage issues (other than in Tashkent City). Due to limited scope of authority, including financial authority, city and district authority cannot have a sizeable impact on the development of this industry.

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**Figure 8: Managing water supply system**

**City authority**

Apports head of "Suvokava" SUE upon presentation by the region (oblast) administration.

Approves tariffs for water and sewage (upon agreement). Assists with debt collection and resolution of organizational matters.

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**Region (Oblast) Administration**

Presents a candidate for the position of the head of city "Suvokava" SUE.

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**"UzKommunHizmat" Agency**

Provides technical assistance.

Prepares and implements strategic investment projects guaranteed by the Government.

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**"Suvokava" SUE**

- provides the city with water supply and sewage services;
- defends plans and reports, itemized lists, carries out independent business activities.

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4.6. Residential Solid Waste Management (RSW)

**Collection and removal of residential waste**

In Uzbekistan, the volume of collected and removed municipal RSW ranges between 3.4 - 9.5 million m³ (Appendix 9). Most of the RSW is generated in the city of Tashkent, cities of Tashkent and Samarkand regions, and in Fergana Valley. The sanitation services actually remove not more than 60% of the waste generated in cities and district centers.

According to forecasts, in the next ten years, the aggregate volume of municipal waste can increase by 30%.

Up until 2001, the collection and removal of RSW in cities was implemented by the enterprises of the former Ministry of Housing and Utilities of the RoU. Afterwards, they were brought under local authorities. Monitoring of the state of affairs in municipal waste management was imposed on "UzKommunHizmat" Agency. However, RSW removal management and monitoring were eventually taken away from the scope of this agency. In the city of Tashkent, "MaxsusTrans", a state owned company owned by Tashkent city administration carries out the bulk of collecting, removing and recycling RSW. "MaxsusTrans" has contracts with over 378,400 entities, including 1252 enterprises, organizations and Private Homeowners' Association (PHA).

Tariffs for collecting, removing and recycling RSW are differentiated for different cities. Payments for RSW, received in banks, are reviewed by the departments of the Treasury, and upon city

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19 Pursuant to Construction Norms and Regulations 2.07.01-89, the norm of accumulation of RSW, taking into account public buildings, is assumed at an average of 400 kg or 1.2 m³ per resident per year. According to these norms, the total volume of municipal RSW, including UTS, should be at least 17.5 million m³ in 2011 (28,233 thousand people × 51.7%/100 = 14,596 thousand people × 1.2 = 17.5). As 165 out of 182 landfills do not have scales, the RSW is mostly counted in volume.

20 The need for garbage trucks and other special equipment is calculated based on the actual volume of completed work. The calculations are based on the number of garbage truck runs per day, transportation of RSW tons km/day, etc.

21 Pursuant to the Law of the Republic of Uzbekistan "On Waste," City administration (khokimiats): participate in the execution of national waste management programs; approve local waste management programs; create conditions for developing entrepreneurial activities in the waste management sphere; resolve the issues of placing waste management objects in respective territories; control the compliance with the waste management legislation; assist in establishing enterprises to collect and recycle waste.
governor (khokim’s) instruction, are used to pay salaries, maintain special equipment, and procure spare parts. 10% of the receipts can be used for incidentals of these entities.

**Operation of landfills and dumps**

Presently, there are 182 landfills operating in the RoU, of which 142 are government-owned. The aggregate capacity of the landfills is 34.5 million m³, including 27.4 million m³ in government possession and 6.8 million m³ in private hands. Total area of landfills and dump sites is 629.2 hectares and 151.8 hectares, respectively, with perimeter extending for 101 km, of which only 7.5 km is fenced off. The selection of land plots for these is agreed upon by the departments of Ministry of Health although without specifying the list of waste items to be discarded. As a result, the technology of waste burial and sterilization is not observed at the majority of the landfills and dumps. Only 38 (or 20.8%) of these sites have RSW collection and control points, and only 17 are equipped with weighing devices. Of the operational landfills and dumps, over 90% are in unsatisfactory condition. Technical, sanitary and ecological requirements are not observed almost universally. Received waste is compacted and partially covered with dirt; composting is done without adhering to technological procedures, which has a negative impact on the environment.

**Recycling**

According to expert estimates, each million tons of RSW contains about 360 thousand tons of food waste, 160 thousand tons of paper, 55 thousand tons of textiles, 45 thousand tons of plastic and other components. A number of enterprises are involved in this area in the RoU, including "Uzbekistan" JSC (leather processing), "Polymer" JSC (processing of abrasive materials, glass and paints), Tashkent Plant for Processing Non-ferrous Metals, "EkomDernService" JSC (processing tires), etc. "Ecostrom," "Termodom" and "ComputerService" limited liability companies recycle up to 100 thousand tons of ash from Angren and New Angren Thermal Power Stations on an annual basis. In Tashkent and in some oblast centers, private companies have mastered the collection and recycling of plastic bottles. At Akhangaran landfill, a recycling enterprise is set up, which mastered the production of a wide range of consumer goods out of RSW. In Tashkent, a company was established to recycle wood waste. In the city of Tashkent, total green area is 12,000 hectares (an average of about 50 m² of vegetation per capita). Every year, the treatment of the green zone creates a large volume of wood waste. By 2015, it can recycle up to 25% of RSW from timber, glass, textiles, waste paper, etc.

In Uzbekistan, the potential for recycling is estimated at 3.5-4 million tons, while RSW recycling market could reach US$500 million per year. According to calculations presented in "Conceptual Approach to Forming Green Economy in Uzbekistan," a CER Analytical Note (Tashkent, CER,
2001), the constructions of waste recycling plants in the territory of large landfills is a profitable venture. For instance, in Tashkent City, the composition of RSW removed to landfills on an annual basis includes up to 850 thousand m$^3$ of waste paper and 140 thousand m$^3$ of textiles.

The problems in RSW management are comprehensive (Appendix 11), and include:

1. **Inadequacy of institutional, financial, economic, investment, administrative and control mechanisms of managing the RSW collection, removal and recycling.** Government authorities and respective industry organizations are not developing specific measures aiming to reduce RSW. City authorities, including Tashkent City Administration, do not have statistical information on RSW. Enterprises, including "MaxsusTrans", do not have untied funds to implement recycling projects. Local producers usually have no liability either for their products, or packaging. In EU, producers have to inform the consumers about how to handle the goods and packaging, and ensure that they are reused or recycled. In a number of countries, for example, imported varnish-and-paint products, rechargeable batteries and power units, and gas-discharge lamps are levied an additional duty (up to 5%) from cost, which is used to finance entities that recycle them (Appendix 12). To this day, separate collection of residential waste is yet to become widespread, while the companies that recycle RSW are not given proper incentives.

2. **Enterprises are not sufficiently equipped with modern specialized equipment.**

As of January 1, 2011, the total number of specialty vehicles in the RoU was 1,777 pieces, including 938 garbage trucks, of which 409 pieces are deployed in Tashkent City. Specialty vehicles bought in 1999 for "MaxsusTrans" are obsolete and worn-out. The system of collecting, transporting and utilizing RSW is falling behind the growing municipal waste and is inconsistent with market mechanisms. "MaxsusTrans" is facing serious financial difficulties. The number of new vehicles to transport RSW just for the needs of Tashkent City is estimated at 300 pieces. In some cities of the country, there is a practice of collecting and removing waste using privately-owned trucks. In addition to this, in order to meet regulatory requirements for RSW disposal at landfills and dumps, there is a need for 546 bulldozers, 182 pressers, 182 water sprinkling machines, and other specialty vehicles (excavators, tractors, dump trucks, graders).
5 CONCLUSIONS

The main institutional reason behind the weak city infrastructure is the inconsistency of the local administration system, lack of authority and weak institutional mechanisms for the participation of local authorities in the planning, construction, and management of infrastructure. Hence, it appears that the priority task in improving of managing urban infrastructure, removing the disparity between the capacity of the city infrastructure (supply side) and the requirements of the demographic growth, and urbanization (demand side) is to resolve the issues concerning the increase rights and authority of local governance bodies. Next priorities are to improve the legal base for operations, to improve financing mechanisms (primarily through increasing the opportunities for local budgets to fund infrastructural projects in the cities). Local authorities should to enhance the coordination between all participants of the process of developing infrastructure, and to examine and develop recommendations to ensure accelerated development and realization of infrastructure projects.

The experience of developed countries indicates a dependence of GDP growth on the level of urban development. The latter, in turn, is directly proportional to the power, stability of the operations of infrastructure service providers and quality management of urban infrastructure. It is obvious that public resources allocated to development and infrastructure support are not going to produce high profits. Nevertheless, the development of infrastructure services will have a multiplicative effect in terms of attracting FDI, the development of cities as centers of industrial and innovative growth, improving the lives of the urban population. In recent years, the construction and modernization of integrated urban infrastructure of Uzbekistan was boosted with vast amounts of public investment. Urban infrastructure and municipal services, as well as the system of state and local budgets were gradually improving in the recent years. However, high rates of population growth, concentration of industrial production in urban areas, the development of agglomerations, places completely new demands on urban infrastructure.

New challenges in this area are related, on the one hand, to the acceleration of urbanization, modernization, technical renovation, the creation of the modern city skyline, on par with international standards.

On the other hand, the challenges are associated with the aggravation of problems of heat supply, water supply, sewerage, electricity and management of urban waste, increase in non-production costs, depletion of resources, sharp increases in receivables and payables of utility companies.

The key problem lies in the inconsistency of the institutional set up, as well as the mechanisms for managing urban infrastructure with the needs of a modern rapidly developing industrial and innovation – based economic growth. The critical assessment of the situation, forecasting the trends in urbanization with a further enhancement of the role of the cities shows a shift to a new system of management of urban infrastructure on a "single owner - a single government customer" (namely, the appropriate Department of city administration). However, the realities of the financial and economic situation of enterprises and technical infrastructure are so complex that significant positive outcomes will be hardly possible without the introduction of effective governance institutions and mechanisms of state regulation. The new management system of urban infrastructure has enormous potential in terms of increasing the effectiveness of the investments in development of infrastructure, introduction of high technology solutions to improve the quality services, promote cost optimization of heat services, drinking water and energy supply, improving the quality of life in cities, and the attractiveness of cities of Uzbekistan for FDI.

It is well known that improved management of urban infrastructure, further enhancing the authority and responsibility of local authorities should simultaneously be accompanied by measures of state regulation.
Governmental requirements cover a wide range of tasks, including but not limited to tariff policy, the regulation of tariffs of natural monopolies, such as drinking water supply and sewage, heat supply, collection and disposal of RSW, municipal improvement, energy supply, etc. tax system, budgeting, procurement, revenue administration, expenditure, oversight & accountability, bidding and procedures, anti-corruption arrangements etc.

The Government of the Republic of Uzbekistan carries out systematic work to reform the state regulation, including of tariffs in the urban infrastructure, improving access of the private sector in this segment of the economy, development of public-private partnership.
6 RECOMMENDATIONS

International experiences indicate that success in urban infrastructure development requires creating an efficient system to manage it, based on the new mechanisms. Such mechanism should be oriented towards the improvement of quality of life, the strengthening of the importance of a city, the increase of efficiency and integrity of the development of such territories, the creation of favorable conditions for competitive market structures and attracting investment resources. A key link in improving the infrastructure management is the increased role and responsibility of city and district authorities.

6.1. Legislation and policies

A number of countries have been using mechanisms of public-private partnerships (PPP) for quite some time. Abroad, the majority of production and social infrastructure objects are owned by the state and municipalities. Even though transfer of their ownership into private hands is not always advisable due to social and political reasons and given high risks, yet, the limited state and municipal budgets and increasing social liabilities of the authorities are behind low growth, and sometimes, reduced expenditure on infrastructural needs.

It is necessary to draft a law on PPP, establish the procedure of selecting a private partner and voiding the contract, regulate risk distribution and provision of guarantees, etc. Besides, for successful application of PPP in the area of city infrastructure, compensation mechanisms should be launched, as one of the main conditions of implementing PPP projects is the provision of opportunities for the private sector to exit the project in a timely fashion, without losing its investments.

In Uzbekistan, PPP are applied in various spheres, except for concessions. And yet, this is the form of cooperation that presents the most interest. The Law "On Concessions" (1995) needs to be revised and amended, as well complemented with a block of standard requirements (norms and objects of the agreement, distribution of risks, forms and methods of financing, etc.)

The Law "On Natural Monopolies" does not provide real opportunities for the State Committee on Demonopolization, Support of Competition and Entrepreneurship to have sizeable impact on natural monopolies, and first of all, on city infrastructure players. The fact that the regulation of tariffs of natural monopolies, such as water supply and sewage, heat supply, collection and disposal of RSW, municipal improvement, electricity supply, etc. is implemented by the Ministry of Finance and its regional bodies compounds the problem with growing payables and receivables. Therefore one of the main areas of improvement is the reform of the regulation of utility services.

In order to increase the role of local budgets in the development of city infrastructure, the following proposals should be considered:

1. A common organic law on budgeting process has to be developed and adopted, and shall have the following provisions\(^{22}\):

\(^{22}\) These proposals are suggested to be taken into account in the development of the Budget Code of the Republic of Uzbekistan, which is planned for 2011-2012.
o determine clear scopes of authority of the subjects at all levels of government authority, including local bodies, in the budget system, as well as legal status of the subjects of legal budgetary relations;
o on a compulsory basis, draft local budgets based on the directions and tied to the social and economic development of respective districts and cities;
o clearly determine the procedure of distributing income and expenses between different budgets to ensure reduced financial dependence of local budgets on state budget and to provide incentives for local authorities to boost their own income potential. A statute on using a certain part of additional income generated while implementing local budgets in the cities that have independent budgets, as well as in the cities that do not have budget- or tax-related rights, for the development of infrastructure, should be stipulated in the legislation;
o delimitate expenses that are covered by the republican or local budgets, and develop mechanisms for regulating inter-budget relations;
o determine main directions to introduce positive changes to be able in future to carry out mid-term budget planning at all levels of the budgetary system, as well as result-oriented budgeting, with a pilot introduction of new mechanisms in certain regions.

3. Along with the development of the new Budget Code, it is important to take stock of the system of local budgets and other mandatory payments to local budgets, as stipulated by the Tax Code.

This task can be resolved both through creation of new sources of payments, and through a rational use of the existing ones. In this context, the reliability of forecasts for the social and economic development of the cities and the quality of managing city property should be improved.

The tax policies, currently providing the required budget income, should create favorable conditions for modernizing the economy, investments into new production facilities and increasing labor productivity. The issues of improving tax collection rates and quality of tax administration remain of relevance. It is necessary to consider approaches to create a module aiming to report consolidated information on the financial assets and property of the cities and districts at local subdivisions of the State Property Committee.

Local authorities should improve the quality of their city development plans. Main objectives for such concepts should be as follows: increase in the economic potential and introduction of investment projects, supporting industrial development; increase in the number of commercial entities with high profit margins, helping to fill city budgets with tax sources. Such concepts should target an annual increase in the tax and non-tax potential of at least 15-20% per annum.

3. The following proposals will increase the efficiency of the budget system in terms of aligning with current demands for the development of urban infrastructure:
o the respective bodies should continue their targeted activities to reduce donations to local budgets, which envisage the creation of new and the development of existing local production facilities, increased employment through stimulate to small businesses, private entrepreneurship, and service industry, and optimization of expenses and the network of budget organizations;
the practice of Infrastructure Improvement and Development Programs should be continued to cover oblast centers that have yet to be included, to be adopted by respective resolutions of the Government. When taking decisions in the area of tax policies, including those aiming to improve the collectability of taxes, not just the short-term fiscal effect from certain innovations should be taken into account, but also their long-term consequences for the economies of the cities, the social sphere and the revenue streams in their budgets;

in case if City Infrastructure Management Departments are established under authorities, these structural subdivisions shall be entitled to conduct detailed studies of the development of urban infrastructure, to take measures to optimize the same, to carry out daily control over the implementation by the executive agencies (subjects) of activities within the adopted city development programs, and to monitor the efficient use of budget funds allocated for the maintenance, repair and development of city infrastructure;

as the Reconstruction and Development Funds are earmarked for the construction of industrial objects, it is advisable to allocate a separate credit line to finance infrastructural projects in small and medium towns of the country. The credit line funds can be allocated on a tender basis to special accounts, which shall be set up by district and city authorities.

4. Prior to accepting the Budget Code, it is necessary to develop measures to introduce respective changes and amendments to legislative acts concerning the improvement of mechanisms of forming republican and local budgets, namely:

- transfer the authority to finance the social sphere to local government bodies, where these are the predominant expense;
- redistribute the authority for capital expenditure from the central level to the local level;
- set allocation norms for national taxes and other mandatory payments to local budgets of the cities and districts, for which these are the main source of revenue.

It is important to continue the practice of adopting Programs for Industrial Improvement and Development of Infrastructure at regional (oblast) centers that have not been covered yet, by adopting respective Government resolutions. When making decisions in terms of tax policies, including those aiming to improve the collectability of taxes, not only short-term fiscal effect from specific innovations, but also their long-term consequences for the economy of the cities, their social spheres and budget revenues, have to be taken into account.

Given that Reconstruction and Development Funds are designated for funding the construction of industrial objects, it seems appropriate to allocate a separate credit line for financing infrastructural projects in small and medium towns of the country. Such credit line funds can be allocated on a tender basis to special accounts that will have to be set up by district and city authorities.

5. Special attention has to be paid to the development of indices and criteria of completeness and comprehensiveness of the information on the development of the infrastructure in all types of cities and districts, with presentation by each subject, regardless of the location, with the purpose of subsequent quantitative and qualitative analysis of the state of urban infrastructure.

As the financing of infrastructural sectors is directly dependent on the funding of budget organizations and the available working capital of the enterprises themselves, it would be well to eliminate the practice of considerable delays in funding most budget organizations (schools, lyceums, higher educational institutions, hospitals, etc.), which result in the accumulation of transferred payables at infrastructure enterprises. Full financing of municipal infrastructure is not possible without full coverage of the costs of production and provision of respective services.

Main instruments and sources of financing:

- switch consumers, regardless of their ownership, to full and timely payment of services;
- redirect irrationally used funds, as revealed during the audit and evaluation of tariffs, towards infrastructure modernization and capacity-building projects. Irrational costs,
overspending, malpractice can be detected during revisions and expert examinations, which, for the purposes of objectivity, should be conducted by independent audit and other organizations;

- ensure that tariffs for services are set correctly and that incoming funds are used efficiently.
- City Authorities, in collaboration with respective organizations and institutions, should achieve the highest possible collection of payments (Appendix 18). Given the specifics of the services, the need for differentiating the fees for certain category of consumers cannot be neglected.

6. Improving the mechanisms of PPP in the implementation of infrastructural projects

Based on the national and international experiences, it is recommended to develop a law on PPP, to determine the procedure for selecting private partners and terminating contracts, regulations for the distribution of risks and provision of guarantees, etc. There is sufficient national experience in this area. Uzbekistan has used many forms of PPP, except for concessions. As foreign experiences indicate, countries in transition find the long-term rent with investment commitments to be the most acceptable form of public-private partnership. At this stage, this form appears to the most advisable for Uzbekistan. The successful development of PPP in the area of urban infrastructure requires the introduction of compensation mechanisms, as one of the most important conditions in the implementation of PPP projects is to provide an opportunity for the private sector to exit the project without losing its investment. The legislation should clearly determine serious reasons for the exit of a partner from infrastructural projects, which should be stipulated in the agreement between the parties. Overall, there is a need in determining the “roadmap” of the infrastructure medium-term development with the involvement of private sector.

6.2. Urban Management

The objectives behind improving the organizational structures of city infrastructure management in Uzbekistan are optimizing of costs, ensuring high level of management, improving the quality of services, and increasing the responsibility of structural subdivisions for their operations. Having said that, the city infrastructure management scheme, as well as mechanisms of financing the critical infrastructure, should be aligned with the scope of demographic, and urbanization processes in the Republic.

- In order to provide for an accelerated development of the infrastructure and create favorable conditions in the cities, it is recommended to establish Municipal Infrastructure Management Departments (hereinafter - Departments) under City authorities.

- A Department should have the status of the sole owner of municipal infrastructure objects and of a state customer (Chart 2).

- The property of such Departments shall be formed from the property that belongs to the founder. This means that all of water supply, sanitation, sewage, heat, gas, electricity supply, RSW sites, located within the territory of a city (district) shall be transferred into the ownership of the respective city authorities, in a manner established by the legislation. The transfer of gas and electricity supply sites and grids located in cities, into the ownership of city authorities will have a multiple effect on the efficiency of the management. First of all, "UzbekEnergo" and "UzTransGas" will be released from alien duties. All daily routine, including enforcement of payment discipline and maintenance of city systems of gas and electricity supply will be the Department's task, which will represent the city interests before "UzbekEnergo" and "UzTransGas". In this case, "UzbekEnergo" and "UzTransGas" can
focus their efforts on strategic issues of increasing generating and transporting capacity, introducing high energy-conserving technologies, etc.

- The establishment of Departments will allow to:
  - rationally use budget funds allocated to maintain, repair and develop city infrastructure;
  - clearly differentiate between the functions of a customer and subcontractor in this sphere;
  - eliminate redundant control and management; increase the efficiency of the utilities sector and transparency of financial streams;
  - strictly report the usage of materials and funds;
  - balance the development of branches of the infrastructure;
  - attract high technologies into the sphere;
  - stabilize the industry staffing;
  - organize contractual conditions in the utilities sector, protect consumer interests;
  - involve small and medium-sized enterprises in infrastructure development projects;
  - enforce payment discipline, reduce payables and receivables;
  - apply progressive forms, mechanisms and instruments for tariff and non-tariff based regulation;
  - increase the responsibility of market players for providing quality services.

- The Departments and "One-Stop Solution" services under city authorities will give an opportunity to increase the efficiency in the operations of HUM entities and to reduce the number of inspecting personnel in more than 10 controlling and monitoring organizations.

- The Departments will ensure consolidated monitoring of delivered utility services and payment discipline. The Departments will put the entire subscriber database into an EIAS.

- The Departments shall be funded from local budgets, renting enterprises, co-participatory shares of city infrastructure objects, penalties against violators of the regulations for using and providing utility services, as well as from other revenues, not prohibited by the law.

- The Departments shall implement the tasks of managing and coordinating the activities of heat, water, electricity, and gas supply enterprises, as well as entities in charge of RSW and municipal improvement. The Departments shall ensure strict observance of the rights of both consumers, regardless of their ownership, and of service providers.

- All services shall be rendered based on contracts between suppliers and buyers of such services. Certain infrastructure objects can be transferred to private companies on contractual terms, for example, management of municipal RSW (while tariff regulation remains within the Department's scope). The Departments shall select, in an established manner, a non-profit management company, and include their representatives in the management board. The Departments shall use various schemes of involving self-governing citizen bodies in the management.

- Within the Departments, own security services and hotlines shall be set up.

It is recommended to test this approach in the cities of Samarkand and Chirchik. Based on the results, best management practices could be replicated in 10-15 cities. Preliminary calculations indicate that the cost of staffing such Departments with the total staff being 858 people (20 people in Tashkent City, 10 people in each of the region (oblast) centers and Nukus, 6 people in each of the
remaining 118 cities) will not exceed 10,296 million soum per year (with gross cost of 1 member of staff being US$562 in equivalent per month.

Figure 11: Conceptual Chart of Organizing Municipal Order and Financing Urban Infrastructure

6.3. Improving Functioning Mechanisms of City Infrastructure Sectors

In addition to the above suggestions, the working group authors are making several proposals aiming to boost the efficiency of agencies in charge of certain sectors of urban infrastructure, within a short timeframe.

Heat Supply

- Reconsider the system of reporting and accounting for the production and consumption of heat energy. Compile IAS databases, first of all, of heat energy and hot water production and consumption meters at boiler stations, in buildings and apartments, and establish a billing system.
- Develop a system of subsidies for purchasing and installing heat energy and hot water meters. On a stage-by-stage basis, reduce the number of subscribers paying for heat service based on consumption norms to the minimum. The installation of heat meters should be accompanied with the repair of apartment buildings to heat-insulate them. In early 1980s, France had an inspection, which revealed that about 50% of the heat escapes outdoors - through windows, walls and roof. A three-year program of insulating residential buildings was adopted. After this, prices were reformed and a shift was made towards local heat supply.
• Adopt a national program for heat-insulating apartment buildings in order to reduce thermal power consumption by 30% by 2020.
• Develop and approve, in an established manner, new standards for the production of construction materials, based on heat-insulation criteria. Introduce a system for rating the heat-insulation of the housing during construction and sale.
• Apply rigid sanctions against the owners of office and other business premises that fall below heat-insulation standards (in summer – excessive electricity consumption for air conditioning). The aforementioned activities should be tested in 2 cities of the country, also within the framework of grants.
• Take measures to improve tariff policies. Optimize the interval for reviewing tariffs. Develop additional measures to regulate heat consumption.
• Target Central Heat Supply development plans towards the optimization of the balance between centralized and decentralized heat supply.
• The activities aiming energy preservation should be backed by a flexible system of benefits and preferences.

Water Supply and Sewage

• Examine several models and best practices of the cities that succeeded in supplying WSS services (for example, Tashkent City, in terms of introducing a billing system). Then, a chosen model should be projected for the implementation in local conditions (Appendix 3).
• Achieve maximum coverage of consumers with water meters, including through provision of micro-loans.
• These activities should be supported by the development of a foundation for the production, service and calibration of meters, and by a gradual reduction of water consumption norms to 110-120 liters per person per day.
• Consider the improvement of mechanisms for providing guarantees to receive preferential loans for purchasing equipment for the WSS system.
• Develop new drafts of Laws "On Water Supply and Disposal" and "On Changes and Amendments to the Law of the Republic of Uzbekistan on Water and Water Use," dated May 6, 1993. They should have provisions to determine an authorized state body in the

23 During 2007–2010 the city of Novosibirsk has implemented an energy conservation program with a budget equivalent of USD 75 million, which allowed many proprietors to install heat meters in their buildings at ½ cost (about USD 4,300 per building) with up to 1 year deferred payment. The rest was compensated from the city budget.

24 It is important to launch the production of small HGE, including combination units, heat pumps, solar water heaters, and to provide government assistance to the owners of individual houses in form of long-term preferential loans to procure heat-generating equipment and to heat-insulate their houses.

25 In Denmark, government grants compensate up to 60% of expenses of private companies building and repairing heat networks, if they are connected to the main grid. A special system of state energy-efficiency related subsidies for the industry and trade, including TPP, is developed. According to "Alternative Sources of Energy: Possible Use in Uzbekistan," an Analytical Report (Tashkent, CER, 2011), Uzbekistan uses about 16.5 billion m³ of natural gas and 0.5 billion m³ liquefied gas per year for daily living needs of the population. If one takes into account that heat and hot water supply to cities and UTs takes up to 75% of the mentioned volume, and ratio for replacement with solar collectors could technically reach 50% per year, the overall saving of natural gas from ubiquitous installation and usage of solar collectors for household needs could constitute 37.5% of total natural gas consumption in households, or 6.375 billion m³ per year (5.17 million TOE). The estimated value of saved natural gas will be USD 1.4 billion a year (at USD 220 per 1,000 m³). Given the current difference between the domestic and export price, net additional income of the gas industry will exceed USD 956 million per year. The installation of solar water heating boilers in all residential housing will require about 13.5 trillion soum.

26 In Finland, part of the work to reconstruct water supply networks is done by municipal organizations. Projects are developed and approved by commissions in local city councils. Companies that supply water are subcontractors of the municipalities. Some contracts provide only for the operation of such systems, while others provide for their repair. Orders are placed through tenders, conducted by the municipalities. At each stage of the construction and operation, companies are regularly inspected by the municipalities (Appendix 6).

27 Normal water consumption in European countries ranges from 150 to 180 l/person/day. In late 1970s, EU witnessed a growing trend in water consumption in the cities of 1.5% to 3.5% per year. However, in the past 10 years it reduced by more than 28%.
sphere of water supply and disposal, differentiate between the scopes of authorities of the Government, the authorized body, local representative and executive authorities in this area.

- Develop a new procedure and terms for the participation of small businesses in municipal water supply and sewage, and develop PPP (Appendix 8)\(^{28}\).

**Electricity Supply**

- Establish that the Departments are the wholesale buyer of electric power and natural gas. Limit the functions of "UzbekEnergo" and "UzTransGas" to the supply of electric power and natural gas, respectively, according to the Department requested volumes and parameters.

- Assign the Departments with the tasks to provide reliable and uninterrupted electricity supply to cities, to develop internal grids, transformer stations, GDS, etc. Foreign experiences of involving private sector in the management of power supply companies are of certain interest\(^{29}\).

- When designing electricity and gas supply systems, provide for a reserve of at least 10% of maximum load. Develop plans to prevent interruptions in the city electricity and gas supply. Ensure lessening of negative consequences of breakdowns; prepare schemes of informing the population and organizations.

- The Departments guarantee the rights of consumers of electric energy and natural gas, ensure compensation of damage inflicted on the consumers by interruptions in their supply.

- Using a "One-Stop Solution" service, have all individual and legal entity subscribers of electric and gas supply networks enter into contracts\(^{30}\).

- Establish a flexible tariff and non-tariff based preferential system oriented towards the conservation of electric power and introduction of energy-conservation technologies, use alternative sources of energy. The implementation of an electricity conservation program in the industrial and residential sectors, including the replacement of fuel units with energy-efficient units can save 35-40% of natural gas\(^{31}\).

- Local authorities are to develop a program for energy conservation, which would cover organizational, and management, institutional, financial and economic, tariff, investment, informational and explanatory, and other issues\(^{32}\). Not in the Russian version.

**Managing Residential Waste**

\(^{28}\) In France, 70% of municipal water supply subjects are private companies. Hong Kong and Singapore are successfully using outsourcing.

\(^{29}\) Seattle City Light (USA) is a company that belongs to the municipality and serves the city and its suburbs. Electric energy is also bought from state-owned HPP. The company has an energy conservation department in charge of energy efficiency issues. The company became a member of a consortium, set up under the Power Supply Department of Seattle Municipality. Power Grids is a Jackson-based (USA) cooperative. Members are the owners of connected power-consuming objects. The cooperative supplies power to an area of 270 x 210 km. It owns about 100 km of power transmission lines and 25 thousand electric meters. The cooperative buys the electricity from a state-owned HPP at 2.3 cents per kWh, and from windmills at 1.6 cents, and sells to consumers at a price of up to 5 cents per kWh (while average price in the USA is about 11 cents). The profit from its activities is distributed between the members.

\(^{30}\) In 2010, the administration of Sergeli District of Tashkent opened a "One-Stop Solution" center. From the beginning of its operation, the OSS center received over 25 thousand applications from citizens to receive various state services in the utilities and other sectors.

\(^{31}\) Alternative Sources of Energy: Possible Use in Uzbekistan, T., CER, 2011/3, 2011

\(^{32}\) Pursuant to the EU Directive on the Energy Performance of Building (EPBD dated August 18, 2010) the basic requirement for energy efficient buildings is heat energy consumption of ≤ 15 kWh/m² per year. In 2009, each house on sale in England is checked by an independent inspector, who rates the efficiency of the house in terms of energy consumption and CO² emissions. In Ireland, an energy-efficient house should consume 85% less of energy, and emit 94% less of CO² than a regular house.
Provide the Departments with authority to license, limit the disposal of waste, implement sanctions or restrictions on burying types of waste that can be recycled\textsuperscript{33}. 
Set up standing working groups to manage RSW, under city and district khokimiat.
Transfer all or a part of the activities to collect and dispose RSW to private entities, with stricter control over their operations.
Appoint "UzKommunHizmat" Agency as the lead agency in charge of management in the sphere of collecting, removing and recycling waste\textsuperscript{34}.
Revise the legislative framework of tax benefits and preferences in the sphere of RSW treatment (Appendix 15). Develop a system of preferential taxes for legal entities and private entrepreneurs, carrying out activities involving collection, removal and disposal of waste.
Introduce a system of compensation payments for the generation of industrial waste and a progressive scale for their burial.
Introduce a mandatory quota on materials, goods and products made of recycled raw materials.
Consider creation of a saving fund from environmental payments for waste disposal, damage claims, and compensations for the degradation of lands used as landfills, other payments and penalties.
The Departments are to be authorized to collect deposits for further utilization of certain types of RSW (Appendix 14).
Establish an off-budget fund for managing waste. The funds for establishing such fund can be found by deducting the deposited cost of packaging and deposited duties imposed on certain imported goods. The fund can be used to maintain and develop landfills, to organize the infrastructure and facilities to recycle waste, and to resolve other issues, related to the disposal of municipal waste. Depending on the industrial capacity, growth of GDP, urbanization and other economic, environmental and social factors, city administrations could use the following mechanisms:
\begin{itemize}
  \item collect and return deposits for containers, tires, varnish and paints, polyethylene, polypropylene, rubber, petroleum products, etc.;
  \item reduce various duties (upon agreement) for enterprises that recycle waste;
  \item increase taxation on the producers of potentially hazardous waste (upon agreement);
  \item increase taxation on the products, whose waste and packaging cannot be recycled (upon agreement);
  \item reduce VAT on products made out of recycled materials;
  \item reduce taxation for investors into environmental measures.
\end{itemize}
Verify the scheme of placing state orders for products manufactured with use of waste (recycled materials). Develop recycled materials exchange (Appendix 16).
Draft a law "On Packaging", according to which cost of packaging should include the cost of recycling.

\textsuperscript{33}In this context significant opportunities present themselves in the creation of a market for recycled products, encouraging their usage in the manufacturing processes, and raising awareness about such activities. In Germany, for example, the information on recycling waste is delivered to the population by the administration and municipal companies in charge of garbage collection. This is their responsibility according to the law. A calendar leaflet is printed with the information about garbage, noting the days and locations for garbage collection.

\textsuperscript{34}In 1999, in France, where annual RSW per person was 343 kg, the resolution of the waste problem was undertaken by the French Environment and Energy Management Agency (ADEME). As a result, municipal waste management costs were successfully reduced by half within 10 years. In the sector of collecting, recycling and disposing waste, the number of jobs increased by 73 times. Presently, municipal waste management system contributes 2% of the country's GDP (Appendix 13).
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Директор Института экономики города Александр Пузанов о перспективах реализации планов по расширению Москвы. www.radiovesti.ru.

www.dorkomstroy.ru
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APPENDICES

Appendix 1: The scope of Authority of Government Bodies in Cities and Districts in terms of Urban Planning Activities.

Article 20. Scope of Authority of Government Bodies in Cities and Districts in terms of Urban Planning Activities.

Government bodies in cities and districts shall:
• control the compliance with the legislation on urban planning, as well as ensure preservation of housing, public and industrial objects;
• resolve the issues of rational displacement, development of utility, transport and social infrastructures;
• implement functions of a customer in developing urban planning documentation to construct local level objects and provide funding;
• restrict, stop or prohibit urban planning activities within their territory, if it fails to comply with the requirements of this Code and any other legislative acts. Restriction, stoppage and prohibition of urban planning activities by subjects of entrepreneurship shall be executed in a judicial manner, except cases of restriction and suspension of activities for a period of up to ten business days due to prevention of emergency situations, epidemics or any other real threat to people's lives and health;
• organize the demolition of unauthorized structures in a legislation established manner;
• participate in the development of district (groups of districts) planning projects, general plans of settlements, detailed plans, and development designs, and organize their implementation;
• take decisions on the construction of objects;
• organize stock taking of the technical condition of buildings, structures and other objects of settlements;
• regularly inform the population on the adopted decisions in the sphere of urban planning;
• carry out other duties pursuant to the legislation.
Appendix 2: Functional Duties Deputy of the Governor (Khokims) of City (District)

1. Implement economic reforms in capital construction, develop and introduce modern methods of designing, establish contractor market, and monitor retail market for construction materials.
2. Organize the development of urban-planning documents, including general plans and detailed plans (DP) of cities, urban-type settlements and villages.
3. Organize the introduction and implementation of economic reforms in utility services; continuously improve the provision of consumers with electricity, natural gas, drinking and hot water.
4. Enforce the execution of economic reforms at fuel and energy, oil and gas enterprises, as well as at other associated organizations and enterprises.
5. Organize the provision of road safety, maintenance, operation and repair of automobile roads, their financing and construction; coordinate intensification of reforms and introduction of market relations in the spheres of transport and communications.
6. Deal with production expansion, strengthening and developing the economic potential of contractors and construction enterprises.
7. Control the construction of colleges, academic lyceums, secondary education objects and Children's Sports Development Fund, as well as the construction of sites of significant economic importance.
8. Provide for, and control the process of collecting and delivering scrap ferrous and nonferrous metals to the state.
9. Regulate the activities on municipal landscaping and providing amenities.
10. Carry out measures to improve the supply of clean drinking water and natural gas to the population;
11. Continuously improve the executive discipline and critically analyze the situation in subordinate spheres / spheres of responsibility, selection and training of staff.
12. Implements other tasks upon the instruction of city khokim.
## Appendix 3: Analysis of City Heat Supply Problems

<table>
<thead>
<tr>
<th>No.</th>
<th>Problem</th>
<th>Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Excessive costs of producing, delivering and selling TP.</td>
<td>Balance TP by sources of thermal power.</td>
</tr>
<tr>
<td>2</td>
<td>High losses of heat in steam grids.</td>
<td>Determine actual heat losses based on TP meters through heat-insulating structures of existing water HS.</td>
</tr>
<tr>
<td>3</td>
<td>TP supply and consumption schedules are mismatched during transitional periods, which causes claims on so-called “excessive heating”.</td>
<td>Carry out technical measures at CHS with the help of energy supplying organizations, and introduce systems for regulating consumption within individual buildings.</td>
</tr>
<tr>
<td>4</td>
<td>Problems in determining future loads.</td>
<td>Determine existing thermal capacity reserves for each TP source. 5-year analysis of heat supply system development. Determine TP consumption trends for industrial consumers and residential sector.</td>
</tr>
<tr>
<td>5</td>
<td>Consumer complaints about heating. A group of HWS problems (water temperature, water dumping due to missing parts in circulation lines, short lifespan of hot water pipes).</td>
<td>Improving the system of interaction between heat supplying organizations and consumers (consumer feedback system and response to consumer complaints, the structure of liabilities before consumers).</td>
</tr>
<tr>
<td>7</td>
<td>The long-term capability to provide heat is determined as unsatisfactory.</td>
<td>Drastic measures are required to restore the grids and upgrade the equipment.</td>
</tr>
</tbody>
</table>
## Appendix 4: International Experience in Managing Heat Supply

<table>
<thead>
<tr>
<th>Heat Supply System</th>
<th>State Incentive Measures</th>
<th>High Technologies</th>
<th>Management</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Denmark</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Municipal heating reaches 70%, and centralized heat supply is 60%.</td>
<td>To stimulate investment activities of entrepreneurs, a system of compensations and subsidies is developed. For instance, a system of government grants for the construction of CHS grids and repair of heat networks (provided they are connected to the main grid), compensating up to 60% of investment. Investment subsidies are available for energy-efficiency measures in industry and trade, including TPP.</td>
<td>Pre-isolated pipes with sealing cover layer and automatic system of detecting heat leakage are installed. Silent &quot;wet running” circulation pumps (GRUNDFOS), heat meters (KAMSTRUP) and systems of regulating heat load (DANFOSS) are developed. Heat losses in CHS grids do not exceed 5%.</td>
<td>Municipal</td>
</tr>
<tr>
<td><strong>Italy</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Predominantly independent heating systems. In the last seven years, CHS growth is 6-7% p.a.</td>
<td>A large-scale energy audit had revealed that the capacity ratio of 40 W/m² was too high. Analysis of assumptions resulted in actual required capacity of up to 23-27 W/m².</td>
<td>New grids are installed with integrated electrical systems of detecting and localizing the damage, which detect humidity in the heat insulation of pipes. When sealing is broken, these systems provide acoustic and light signals.</td>
<td>Municipal</td>
</tr>
<tr>
<td><strong>Finland</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The share of CHS in major cities reaches 80%. During the last 10 years, tariffs increased by 2.5 times, which goes in parallel with the inflation and energy market trends.</td>
<td>Competition control organizations review complaints of enterprises and individuals. Connection to CHS system is based on the customer's free choice.</td>
<td>Heat losses during transportation and distribution are ≤ 5%.</td>
<td>Municipal</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>CHS companies by organizational structure (form of ownership): • LLC - 75%; • municipality department - 15%; • public companies - 10%.</td>
</tr>
<tr>
<td><strong>France</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In the last ten years the tariffs for energy, gas and other types of fuel increased 4-fold. In 2000, utility payments represented about 22% of the income of an average family of four; in 2009 - 24%.</td>
<td>In late 1970s, France had an inspection, which revealed that about 50% of the heat escapes outdoors - through windows, walls and roof. A three-year program of insulating residential buildings was adopted. After this, prices were reformed and a shift was made towards local heat supply.</td>
<td></td>
<td>Municipal</td>
</tr>
<tr>
<td><strong>Poland</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In the cities of Kalisz and Walbrzych, municipal systems of heat supply are transformed into joint-stock companies. In a number of cases, lease or production contracts are used.</td>
<td></td>
<td></td>
<td>Involvement of a private managing company instead of change in ownership of</td>
</tr>
</tbody>
</table>
Germany

A law on renewable energy heating was adopted. Application of new norms provides for 40% saving in heat energy.

Estonia

In 2008, a tender to sell the shares of Tallinn heat supply company and 30-year concession was held. The evaluation criteria in the selection were: high concession payments, restricted growth of tariffs, increased economic efficiency and experience in business management. Starting from January 1, 2009, buildings under construction are required to have energy rating certificates.

New standards and measures to modernize HS to apartment buildings resulted in 30% saving in heating expenses.

EU

The Directive on the Energy Performance of Building (EPBD) came into force on August 18, 2010. The basic requirement for energy efficient buildings is heat energy consumption of ≤ 15 kWh/m² per year. In essence, through the implementation of DEPBD, EU countries are undergoing an energy revolution in heat supply systems, transitioning from 200-240 kWh/m² per year to a new, technically achievable and economically viable number, which will become the standard for the next 30 years.

Heat supply sector mostly uses billing systems. Meters are installed in all buildings connected to CHS. Building heating bills are distributed between apartments based on their footage and relative positions (for example, there is differentiation between inner and front apartments that have different conditions for heat exchange). The heating tariff consists of fixed and variable payments. There are general rules for setting tariffs. Primarily, the tariffs should ensure sustainability of a CHS company, so that to provide for profitability on one hand, and competitiveness on the other. Tariffs must be reasonable for consumers, compared to alternative methods of heating. They should be developed and introduced on a long-term basis, so that to enable the clients to plan their family budgets. Tariff components should reflect the costs. A new subscriber signs a contract with heat supplying company for heat supply. The contract lists heat supply services and terms for their delivery, as well as the liability and responsibility of the consumer.

The government does not directly participate in setting tariffs. Only when a consumer complains about an inappropriate tariff, the competition body resolves whether there is free competition at play.

Great Britain

Starting from 2009, each selling house has an energy efficiency rating. Energy efficiency certificate is part of the informational package of any house. Each house on sale is to be examined by an independent inspector, who determines its efficiency in terms of energy consumption and СО² emissions. In Ireland, a "passive" house should consume 85% less of energy, and emit 94% less of CO² than a regular house.

Cities of Dubna and Nerungri (Russian Federation)

In 2008, an IBRD loan was obtained to upgrade city heat supply networks. During the first stage, 40 km of heat grids were replaced, 2 boiler stations were automated, and 200 IHP’s were installed. This resulted into an annual saving of USD 54 thousand equivalent. Aggregate reduction in costs was USD 197 thousand equivalent. Thanks to these savings, borrowed funds are being returned to creditors without an increase in utility tariffs. To modernize the heat supply grids, engineering solutions that include ALFA LAVAL, efficient heat-exchange units, were used. Boiler stations were equipped with GRUNDFOS UPS200 and UPD Series circulation pumps, which were included in the control rooms. A similar scheme was used to upgrade the heating system in the city of Nerungri, where the saving amounted to 70 thousand Gcal/year.
Appendix 5: International Experience in Managing City Water Supply and Sewage

<table>
<thead>
<tr>
<th>Reforming methods</th>
<th>WSS ownership</th>
<th>Privatization methods</th>
<th>Municipal authorities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Privatization and floating. Finding ways of transferring utilities from government sector to private hands via &quot;cost-efficiency&quot; mechanisms. Concessions, a form of PPP, involving private sector in the management of state property or in providing services are mutually beneficial terms, are more widely used. Concessions imply that concessor (the state) transfers the concessionaire the right to operate infrastructural objects, enterprises, or equipment. In exchange, the concessor receives remuneration in the form of a single (lump sum) or regular (royalty) payments. Various types of concession agreements are used in practice.</td>
<td>Not just transfer ownership to private hands, but also control over state and municipal enterprises and assets. In France, 70% of municipal water supply is transferred into private hands.</td>
<td>The sale of shares, divestment, management or employee buyouts, lease and subcontracting, transfer of management of state and municipal enterprises to private managers. Local administrations have contract departments within their structure that are in charge of these issues. Partial privatization through execution of management contracts for municipal objects allows city authorities to continue the provision of a specific service, while limiting its role to the one applicable for the status of public authority: forming demand, taking decision on the procurement of goods (services), control the implementation of contracts and payment of bills.</td>
<td>City authorities are the main responsible party for the creation of regulatory base and set tariffs for services to be paid by consumers. Main tasks of the authorities and local self-government bodies in this sphere is to provide opportunities for private companies to do business, coordinate private companies and entrepreneurs in the sector of municipal utilities.</td>
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</tr>
</tbody>
</table>

EU

JSC and LLC

Poland and Hungary

France

An important role in utilities sector belongs to homeowners’ associations (HA), which are non-commercial organizations, uniting the owners or co-owners of real estate, established to manage a group of properties, provide for its maintenance, ownership, usage and disposal. There are 36,000 HA's in France. Their number increased 1.6 times during the period between 2000 and 2008. HA's are in charge of water supply, sewage, RSW removal and recycling, maintaining and lighting streets, organizing the operation of public transportation, manage certain social and cultural institutions, ensure public order and observance of sanitary and hygiene requirements. They are managed by the Municipal Council elected every six years through universal voting, and by the mayor, who in turn is elected by the Council. Upon completion of HUM infrastructure, all of its objects are transferred to the municipality. All work is done through the municipality, which is liable before citizens. Citizens have the largest impact - they vote. Utility services are predominantly municipal. At the same time, concessions are quite widely used. Services are rendered by the concessionaire, who has the right to charge the consumers for its services. Opponents of the participation of private sector fear that the transfer of operations to the private sector will create opportunities for deriving profits at the expense of disadvantaged population.

SEA and Latin America

SEA and Latin America

French operators have more than 100 years of experience in managing WSS enterprises.
1.4 million houses are united into 70,000 joint-stock companies, owners of real estate. 71% hire real estate management companies (operators), while 29% are self-managed. Operators (management companies) select operating companies, who either provide services themselves, or based on agreements with specialty companies. Operating companies present annual reports to residents about income and expenses, as well as about the balance of the owners’ association. Local water supply grid is a wholly-owned city structure. It is a commercial entity with its own budget. It has water supply and sewage networks, as well as water towers at its disposal. In 2006, the company borrowed EUR 150 million for 20 years and is returning it from its own income. Having said that, it still provides benefits and subsidies to certain groups of the population. Up to 80% of subcontractors are selected in competitive bids. A part of works concerning the reconstruction of the infrastructure is executed by municipal organizations. Projects are developed and approved by commissions in local city councils, with many issues being resolved by the citizens via representatives in local self-government. Companies that supply water, sewage, collect and recycle garbage, are subcontractors of the municipalities. There is a large variety of contracts. Some provide for the operation of certain systems, while others cover the responsibility for repairs. Orders are placed through tenders, conducted by the municipalities. At each stage of the construction and operation, companies are regularly inspected by the municipalities. Standards, for example for the quality of water, are set at the government level. Contracts between the municipality and operation companies determine specific terms, for example water pressure, diameter of pipes, material of pipes, tariffs for rendered services, etc. Collection and processing of data, interaction of utility providers with consumers and structures is done through Internet or other informational resources. The automation of utility services cost about EUR 7 billion in 2009, or 3.6% of the country’s GDP.
Appendix 6: List of Laws, Regulatory and Legal Acts on Electricity Supply

- Resolution of the Cabinet of Ministers of the Republic of Uzbekistan dated February 24, 2001, No.93, "On Measures to Organize the Operations of "UzbekEnergo" state joint-stock company";
- Resolution of the Cabinet of Ministers of the Republic of Uzbekistan dated January 11, 2007, No.12, "On Additional Measures to Stabilize the Consumption of Electric Power";
- Resolution of the Cabinet of Ministers of the Republic of Uzbekistan dated June 05, 2009, No.150, "On Additional Measures to Improve the System of Reporting and Controlling the Consumption of Electric Power";
- Resolution of the Cabinet of Ministers of the Republic of Uzbekistan dated July 04, 2009, No.186, "On Measures to Organize the Activities of Private Operators and Timely Payments for Electric Power";
- "Regulations on Tariff Groups of Consumers of Electric and Heat Energy."
Appendix 7: Scope of Authority of City WSS Management and Regulation Bodies

<table>
<thead>
<tr>
<th>Scope of authority</th>
<th>Main legal and regulatory act, regulating the authority and responsibility</th>
<th>Participation in financing</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local State Authorities</td>
<td>Provides for the implementation of legislative acts, including with respect to the issues related to water supply and sewage.</td>
<td>Direct participation. Finances, as much as possible, urgent needs of WSS projects from local budgets, in an established manner, as well as provides for 10% of incidentals. Approves and coordinates the tariffs for services, once a year. Assists in attracting equipment and free funds for the needs of WSS subjects. Assists in optimizing payables and receivables of WSS subjects. With the help of districts committees and other organizations, assists in reducing receivables from the population and legal entities for rendered services.</td>
<td></td>
</tr>
<tr>
<td>State Committee of the Republic of Uzbekistan for Nature Protection</td>
<td>Executive body protecting environment and natural resources. Responsible for the coordination of activities on the protection of environment and natural resources of other state organizations, on central, oblast and district levels.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ministry of Health</td>
<td>Authorized to implement state sanitary control of the compliance with sanitary norms, rules and hygienic standards by all organizations within the country. SSEC centers provide for the organization and implementation of a range of sanitary and anti-epidemiologic activities.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


<table>
<thead>
<tr>
<th>Ministry of Culture and Sports of the Republic of Uzbekistan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provides state protection of cultural heritage sites by, among other things, issuing permissions for carrying out land, construction, ameliorative, business or other activities at cultural heritage sites, cultural heritage site preservation activities, as well as for conducting research at cultural heritage sites. When building new objects, reconstructing existing objects in Bukhara, Samarkand, Shakhrisabz, Khiva and other historic cities, respective permissions have to be received and borders of the construction sites have to be agreed with the borderline of historic and cultural reserves, as determined by the Ministry of Culture and Sports based on the approved historic and cultural plans. (Article 10 of the Law of the RoU “On the Protection of Cultural Heritage Sites”).</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Republican Emergency Anti-epidemic Commission</th>
</tr>
</thead>
<tbody>
<tr>
<td>Authorized to coordinate the activities of ministries and departments, khokimiats, and commercial entities aimed at localizing epidemic outbreaks of infectious diseases. The Commission is charged with the control of activities concerning sewage, efficient cleaning and treatment of waste water dumped into surface water reservoirs. The Commission has the right to prohibit or temporarily suspend the operation of water supply, sewage, hydro-technical and other utilities.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Water Service Companies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Management of water supply and sewage systems is a direct responsibility of economically sustainably “Vodokanal” (Water Service Companies) OPA's and CPA's, which are specially formed upon resolutions of authorized state bodies in accordance with their territorial jurisdictions. The operations of “Vodokanal” companies are governed by the general legislation applicable to the regulation of commercial entities with various forms of ownership. However, these organizations are subject to the Law &quot;On Natural Monopolies.&quot; Constitutive documents – charters of “Vodokanal” companies are approved by respective khokimiats.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Self-Governing Bodies of Citizens</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mahalla citizen gatherings of cities hear reports of district, city and oblast khokimiat management on the issues that fall within the scope of self-government bodies; as well as, within the scope of their authority, - reports of heads of enterprises, institutions, Law of the Republic of Uzbekistan “On Self-Governing Bodies of Citizens,” dated April 14, 1999.</td>
</tr>
</tbody>
</table>
organizations located in respective territories, on the issues of environment, municipal improvement, etc. Implements public control over the observance of laws and other legislative acts, as well as their own decisions; take decisions on the usage of the funds of enterprises and organizations, located within respective territories, for the purposes of municipal improvement, landscaping and sanitary cleaning, on contractual basis; conducts activities aiming to assist the protection of environment.
Appendix 8: Regulatory and Legal Framework on Managing Waste

The state policy in waste treatment is determined by the following laws:

Protection of environment and usage of recycled materials are also governed by the following Resolutions of the Cabinet of Ministers:
- "On Measures to Increase Efficiency of State Sanitary Control," dated April 08, 1998, No.147;
- "On the Harmonization of Activities of Enterprises on the Usage and Utilization of Mercury-Containing Lamps and Devices," dated October 23, 2000, No.405;
- "On Approving the Regulations for Licensing Activities Dealing with Ionization Radiation Sources," dated March 06, 2004, No.111;
- "On Approving the Regulations for Licensing Activities in the Extraction of Precious and Rare-Earth Metals and Gem Stones," dated March 09, 2004, No.112;
- "On Improving the Regulation of Imports and Exports of Ozone-Depleting Substances, and Products Containing the Same, in the Republic of Uzbekistan," dated November 11, 2005, No.247;
- "On Improving the System of Payments for Special Use of Natural Resources," dated February 06, 2006, No.15, as well as other regulating and governing documents in the sphere of waste management.

Regulatory and legal regulation of RSW treatment stipulates strict barriers in terms of sanitary norms and rules, standards for RSW management, generation, storage and burial. Namely, certain important documents are:
- "Regulations for the Procedures of Maintaining State Cadaster of Waste Burial and Disposal Sites";
- GD 118.0027719.1-91, "Procedure for Issuing Permissions for Decking (Burial) of Waste";
- GD 118.002771425-93, "Procedure for Exercising State Ecologic Control at the Sites of Disposing Residential Solid Waste of Settlements of the Republic of Uzbekistan";
- GD 118.0027714.31-94, "Procedure for Exercising State Ecologic Control (Inspection) at the Sites of Disposing Toxic Industrial Waste of the Enterprises of the Republic of Uzbekistan";
- SNIP RoU No. 0068-96, "Sanitary Rules for the Collection, Storage, Transportation, Sterilization and Disposal of Residential Solid Waste (RSW) in the cities of the Republic of Uzbekistan";
- SNIP RoU No. 0056-96, "Organization and Operation of Medical Prevention and Treatment Facilities";
- "Temporary Classifier of Toxic Industrial Waste and Methodical Recommendations on Determining the Class of Toxicity of Industrial Waste," No. 4286-87 dated May 05, 1987;
- GD 118.0027714.60-97, "Nature Protection. Treatment of Industrial and Consumer Waste. Terms and Definitions";
- CMC 2.01.12-96, "Landfills for Sterilization and Burial of Toxic Industrial Waste. Main Regulations for Designing";
- SNIP RoU No. 0026-2002, "Taking Stock, Classifying, Storage and Sterilization of Industrial Waste";
- SNIP RoU No. 0149-04, "Sanitary Rules and Norms for Collecting, Storing and Disposing Waste at Medical Prevention and Treatment Facilities";
- SNIP RoU No. 0157-04, "Sanitary Requirements for Storing and Sterilizing Residential Solid Waste at Special Landfills in Uzbekistan."

"UzKommunHizmat" Agency has approved the following documents:
- "Rules for Providing Utility Services for Removing Liquid and Solid Residential Waste" (1998);
- "Standard Time for Mechanized Cleaning and Sanitary Treatment of Settlements in the Republic of Uzbekistan" (1998);
- "Service Standards for Workers Involved in Sanitary Maintenance of Housing" (1998);
- "Service Standards for Workers Involved in Sanitary Maintenance of Roads and Artificial Structures" (2001);
- "Rules for Transporting Residential Waste" (2003);
- "Methodology of Organizing Two-Stage Removal of RSW" (2004);
- "Instruction for Designing and Operating RSW Landfills";
- Qualification Requirements for the Management, Specialists and Employees of Sanitary Cleaning Entities;
- "Methodical Recommendations for Developing Sanitary Cleaning Schemes in Cities and Settlements of the Republic of Uzbekistan";
- "Methodical Recommendations for Determining Norms of Accumulating RSW";
- "Recommendations for Organizing Separate Collection of RSW";
- "Rules for Developing City Sanitary Cleaning Schemes";
- "Rules for Technical Operation of Structures, Vehicles and Mechanisms of Sanitary Cleaning Entities".

Pursuant to Article 6 of the Law "On Waste," authorized state bodies in the sphere of waste treatment are the State Nature Protection Committee, Ministry of Health, “UzKommunHizmat,” and "SanoatGeoConTechNadzor." "UzKommunHizmat" Agency is in charge of:
- the methodical management of waste generated in the country;
- the development of state programs on residential waste management and presenting the same to the Cabinet of Ministers for approval, in an established manner;
- monitoring the state of collection, transportation, recycling and disposal of residential waste.
However, as part of further reforms, the functions of the Agency have considerably reduced. Yet, it kept the subdivision that develops regulatory documents, "UzKommunUquvTashkilotchi" RTRSEC.

Pursuant to the Laws "On Nature Protection" and "On Waste," the general authority for controlling the compliance with the legislation in terms of waste management is given to the State Committee of the Republic of Uzbekistan on Nature Protection, which:
- exercises state control over enterprises generating industrial and agricultural waste, enterprises that are residential waste management operators, waste recycling, disposal and deposition sites, and other legal entities and individuals subject to the aforementioned laws;
- maintains state cadastre of waste burial and disposal sites;
- conducts state ecologic inspection of scientific research and technological developments and design and budget documentations in the sphere of waste management.

The Ministry of Health is charged with the implementation of the following tasks:
- state sanitary control over the compliance with the requirements of the Laws "On State Sanitary Control," "On Radiation Safety," and "On the Protection of Citizen Health";
- establish sanitary norms and rules for waste management; release findings of the state sanitary and hygienic inspections of waste management sites;
- performs other duties in accordance with the legislation.

The State Inspection "SanoatGeoConTechNazorat" performs state control and supervision over the reporting, storage and disposal of waste of mining and processing plants, and over the radiation safety during storage, transportation, disposal and burial of radioactive waste.
### Appendix 9: Dynamics of Growth in Population, GDP and City RSW during 1996-2010

<table>
<thead>
<tr>
<th>Year</th>
<th>Average listed urban population (thousand people)</th>
<th>GDP growth (%)</th>
<th>RSW, collected and removed to landfills (million m³)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1996</td>
<td>8,948</td>
<td>1.7</td>
<td>9.5</td>
</tr>
<tr>
<td>1997</td>
<td>9,063</td>
<td>5.2</td>
<td>9.0</td>
</tr>
<tr>
<td>1998</td>
<td>9,156</td>
<td>4.3</td>
<td>7.5</td>
</tr>
<tr>
<td>1999</td>
<td>9,235</td>
<td>4.3</td>
<td>5.7</td>
</tr>
<tr>
<td>2000</td>
<td>9,295</td>
<td>3.8</td>
<td>5.2</td>
</tr>
<tr>
<td>2001</td>
<td>9,357</td>
<td>4.2</td>
<td>4.6</td>
</tr>
<tr>
<td>2002</td>
<td>9,411</td>
<td>4.0</td>
<td>5.3</td>
</tr>
<tr>
<td>2003</td>
<td>9,451</td>
<td>4.2</td>
<td>3.4</td>
</tr>
<tr>
<td>2004</td>
<td>9,512</td>
<td>7.4</td>
<td>4.3</td>
</tr>
<tr>
<td>2005</td>
<td>9,565</td>
<td>7.0</td>
<td>3.6</td>
</tr>
<tr>
<td>2006</td>
<td>9,605</td>
<td>7.5</td>
<td>6.7</td>
</tr>
<tr>
<td>2007</td>
<td>9,648</td>
<td>9.5</td>
<td>7.9</td>
</tr>
<tr>
<td>2008</td>
<td>9,698</td>
<td>9.0</td>
<td>-</td>
</tr>
<tr>
<td>2009</td>
<td>14,236</td>
<td>8.1</td>
<td>5.2</td>
</tr>
<tr>
<td>2010</td>
<td>14,596</td>
<td>8.5</td>
<td>-</td>
</tr>
<tr>
<td>2011</td>
<td>14,659</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

*Source: compiled using data of State Statistics Committee, "UzKommunHizmat" Agency, and region (Oblast) administration reports.*
### SWOT Analysis of City System for Managing Residential Waste

<table>
<thead>
<tr>
<th>Strengths</th>
<th>Opportunities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Government supported measures, aiming to improve RSW management systems</td>
<td>Creating waste recycling and disposal market.</td>
</tr>
<tr>
<td>City Authorities interest in resolving the waste problem.</td>
<td>A wider involvement of the population and self-government bodies in the waste</td>
</tr>
<tr>
<td>Certain interest from businesses to invest into waste recycling.</td>
<td>problem resolution.</td>
</tr>
<tr>
<td>Existing private companies recycling waste.</td>
<td>Organize separate collection of recyclable and reusable waste.</td>
</tr>
<tr>
<td>Establishing competitive waste removal organizations locally.</td>
<td>Introduce new waste recycling technologies.</td>
</tr>
<tr>
<td></td>
<td>Attract investments.</td>
</tr>
<tr>
<td></td>
<td>Stimulate competition in RSW management, including through wider participation</td>
</tr>
<tr>
<td></td>
<td>of SB in the collection, transportation and disposal of RSW.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Weaknesses</th>
<th>Threats</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low collectability of waste removal fees.</td>
<td>Growing social tension due to increased fees for waste removal.</td>
</tr>
<tr>
<td>Measures aiming to reduce the generation of RSW, are inefficient.</td>
<td>Waste landfills overfilled.</td>
</tr>
<tr>
<td>Insufficient number of special vehicles at enterprises.</td>
<td>Emergency situations, caused by violations in waste removal and disposal.</td>
</tr>
<tr>
<td>Insufficient interest of RSW management subjects in end results.</td>
<td>Environmental, sanitary and epidemiological threats.</td>
</tr>
<tr>
<td>Poor responsibility of RSW collection, removal and utilization organizations.</td>
<td></td>
</tr>
<tr>
<td>Lack of a civilized market for collecting and disposing waste.</td>
<td></td>
</tr>
<tr>
<td>Shortage of trained specialists.</td>
<td></td>
</tr>
</tbody>
</table>
Appendix 11: Regulation of RSW in Europe, USA, Canada, Japan and Korea

- high ecologic standards for waste disposal;
- special marking on recyclable packaging and goods and on environmentally hazardous goods and materials that are subject to utilization;
- creating an efficient system for collecting RSW, backed with rigid and irreversible sanctions for violations;
- introduction of differentiated and flexible economic stimuli, for example, deposits on plastic containers;
- introduction of subsidies. According to Chadbourne & Parke, in the USA municipal authorities are required to buy products manufactured of recycled materials. In case if there is a considerable difference with the price of "all-new-material" products, they receive subsidies from the federal budget;
- incentives to companies disposing and recycling waste. In particular, in a number of countries, packaging manufacturers pay a special fee, which is used to subsidize companies that recycle such packaging;
- holding awareness campaigns, aiming to change people's attitude towards products made of recycled materials. In most EU and Northern American countries, buying products made of recycled materials is good manners. For example, in the USA, November 15 is declared as America Recycles Day.
Appendix 12: Foreign Experience in Disposing RSW

In the USA, about 55% of the RSW is taken to landfills for burial, 12.5% is burned to generate energy, and 32.5% is recycled. In 2012, the level of recycling will reach 60%. In the EU countries 40% of the RSW is stored at landfills, 40% is recycled and 20% is burned for energy. In general, a transition from landfill burial to industrial recycling has become the main trend in resolving RSW problem. Despite the high growth in the capacity of RSW recycling and processing RSW, the share of stored waste by 2012 will be about 68%. The developments in landfilling mostly concern increasing the load per unit of area, by increasing the density of stored RSW and height of its decking.36

Burning RSW at waste incineration plants
There are 8 TPS in New York City that use RSW. Switzerland, France, the Netherlands and Northern European countries burn 50-80% of waste to generate heat and electric energy. In the FRG, 53 large plants destroy 14.5 million tons of waste to generate 2.1 trillion Wh of electric power. Cost of incineration averages between EUR 102-130 per ton, while storage at landfills costs EUR 114-228 per ton of garbage. At the same time, even cutting edge WIP's do not solve the problem of dangerous emissions generated while burning waste. Taking this into account, foreign countries are steadily transitioning towards the construction and usage of garbage recycling plants.

Integrated processing
Analysis of technological policies of various countries indicates that RSW disposal through garbage recycling plants is the method that most closely meets the requirements of environment, economy, resource conservation and the market. Methods and forms of using various technologies depend on the level of the country's development, its traditions and the welfare of its population. Foreign experience shows that rational organization of waste recycling allows using up to 90% of utilization products in the construction industry, for example, as an infill concrete. According to specialty firms, the incineration of 1,000 kg of RSW generates heat power equivalent to burning 250 kg of oil fuel. However, the real economy is much more than that, as this does not take into account the saved materials, and the costs of their production, i.e. the cost of oil production and receiving oil fuel out of it. In the USA, for example, the recycling market has 122 thousand entities employing over 1.6 million people. The value of environment technologies market is estimated at USD 659 billion. A significant result of these measures is the considerable reduction in the cost of utilizing waste, as well as created demand for goods made with recycled materials. All of this turns re-using and recycling of waste into a profitable business, as well as creates the basis for attracting private investments. As an example, 2009 revenues of Waste Management Inc., a company that specializes in industrial and household waste utilization and processing, totaled USD 14 billion, with net profit reaching USD 182 million.37

36 Modern roller compactors allow condensing RSW to 0.8 t/m³. The height of decked RSW reaches 60 m. Application of these methods allows increasing the capacity of landfills 5-6 times.

37 An important instrument in reducing waste is changing the consumer culture. The "waste explosion" that took place in the last third of XX century in developed countries, was primarily caused by changes in packaging technologies, as well as reduced life spans of goods and wide usage of disposable goods. A drastic drop in RSW does not seem possible without breaking the mentioned two trends. In developed countries, the introduction of advanced technologies of recycling RSW was preceded by extensive work to create legal and economic conditions, as well as to change people's attitude towards this problem. For instance, German population's habit to dispose different color glass in separate containers took over twenty years to develop.
Appendix 13: Improving the Management of RSW

<table>
<thead>
<tr>
<th>Positive dynamics in waste management</th>
<th>Problems</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Timely removal of waste from cities.</td>
<td>Poor awareness of the general public of the activities of enterprises, of the impact of waste on environment and people's health.</td>
</tr>
<tr>
<td>2. Emergence of private enterprises collecting, removing, recycling and disposing waste.</td>
<td>Unpreparedness of city khokimiats to take independent decisions to allow SB and PE into RSW management. Poor competition in waste management. Low prestige value, insufficiency of economic instruments makes this sphere unattractive for entrepreneurs.</td>
</tr>
</tbody>
</table>

**Evaluation of Residential Waste Management System**

<table>
<thead>
<tr>
<th>Benefits</th>
<th>Problems</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. High cost of waste and presence of enterprises willing to pay for large batches of good quality waste (scrap paper, textiles, motes, etc.). For example in Tashkent there are about 15 private companies processing scrap paper and textiles.</td>
<td>Large volumes of generated waste. Lack of interest from the majority of population to segregate waste.</td>
</tr>
<tr>
<td>2. There are SB and PE which are prepared to introduce new methods for collecting and disposing of waste.</td>
<td>Underdeveloped waste management infrastructure and low quality of services.</td>
</tr>
<tr>
<td>3. Separate collection of waste is made possible within building surrounding areas.</td>
<td>There is no accurate information on the composition of waste and dynamics of its growth or reduction. A technology for determining the morphological composition of waste is available. However, implementation of this work requires specialists, equipment and funds. Few options for organizing separate collection are available.</td>
</tr>
<tr>
<td>4. Large areas are allocated for dumps.</td>
<td>Lack of flexible technique to calculate fees for residential solid waste removal and methods of collecting such fees from the population and organizations.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Benefits</th>
<th>Problems</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. There are SB and PE which are prepared to introduce new methods for collecting and disposing of waste.</td>
<td>Lack of centralized body to manage city waste.</td>
</tr>
<tr>
<td>3. Separate collection of waste is made possible within building surrounding areas.</td>
<td>Lack of interest in waste management.</td>
</tr>
<tr>
<td>4. Large areas are allocated for dumps.</td>
<td>Few companies, recycling or collecting waste. Few options for utilizing waste (primarily dumps).</td>
</tr>
</tbody>
</table>
## Appendix 14: Planning the RSW Management

<table>
<thead>
<tr>
<th>Objectives</th>
<th>Methods of implementation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Reduce the generation of municipal RSW.</td>
<td>Reduce the amount of packaging and change its quality. Put disposal instructions on packaging. Increase fees for waste. Introduce new technologies of producing no-waste goods.</td>
</tr>
<tr>
<td>2. Reduce RSW.</td>
<td>Reuse packaging. Refuse to use unnecessary packaging.</td>
</tr>
<tr>
<td>3. Establish monitoring.</td>
<td>Create municipal RSW AMS.</td>
</tr>
<tr>
<td>4. Incentivize and promote re-usage of goods and containers.</td>
<td>Develop the production of multiple-use goods. Expand product and container collection points. Label goods and products about possible re-usage. Financial incentives for depositing goods for re-using through deposit (refund) value.</td>
</tr>
<tr>
<td>5. Develop waste recycling market. Create conditions to boost attractiveness of waste recycling activities.</td>
<td>Ensure that fees for waste removal are close to actual cost of its utilization. Stimulate waste recycling activities through tax preferences and by providing direct assistance. Organize waste exchange.</td>
</tr>
<tr>
<td>6. Composting waste.</td>
<td>Setting special locations for composting waste of municipal gardening and park maintenance activities.</td>
</tr>
<tr>
<td>8. Develop the regulatory framework (for selling waste).</td>
<td>Determine ceilings for generating waste and increase administrative liability of the population and enterprises for their violation. Improve rules and regulations for the collection, removal, burial and utilization of waste, as well as the regulatory framework to stimulate selling waste.</td>
</tr>
<tr>
<td>9. Improving and boosting the level of service.</td>
<td>Implement the principle of financial incentives for the personnel to provide quality services. Equip sites and containers according to aesthetical norms. Introduce safe special uniform and special catering for street cleaners and employees of waste removal enterprises. Financial incentives for quality work of the employees.</td>
</tr>
<tr>
<td>10. Develop environmental education. Enhance the level of culture in terms of RSW treatment.</td>
<td>Introduction of special lessons and encouragement of teachers. Installation of environmentally friendly and aesthetically appealing cans for municipal garbage. Provide methodical guidelines and prepare information materials. Conduct annual thematic contests. Organizing advertising in mass media, on the streets; set up propaganda teams with speeches. Ensure competition in waste management. Hold tenders for the long-term right to provide the service. Introduce standards for assessment of the companies’ performance taking into account people’s opinions.</td>
</tr>
<tr>
<td>11. Boost collectability of waste removal fees.</td>
<td>Ensure correlation between the collection of fees and the quality of services. Improve fire regulations and increase liability for violating the rules of maintaining building surrounding areas.</td>
</tr>
<tr>
<td>12. Resolve the problem of unauthorized dumps.</td>
<td>Install additional bins and ensure timely removal of RSW. Transfer the sites, used as dumps, for specific needs (to organize parks, flowerbeds, etc.).</td>
</tr>
<tr>
<td>13. Establish organizational structure for waste management.</td>
<td>Establish a specialized unit within city administrations (department) to coordinate the activities of all departments and organizations, and to provide conditions for an open dialogue with the population on the issues of waste management and implementing waste minimization strategy.</td>
</tr>
</tbody>
</table>

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38 In 2004, as part of a UNDP project, the State Nature Protection Committee has created an electronic database that includes categorized information about: household, medical, industrial, radioactive and agricultural waste. The database contains information on all regions of the country in terms of the quantity of generated and accumulated waste of all types, as well as the degree of their hazard. However, this activity was not followed up.

39 The quantity and quality of landfills should ensure timely removal and safe placement of non-recyclable RSW. The location of landfills should not just minimize transportation costs, but also preserve the environment.

40 40% of surveyed citizens think that the reason for soiling on the streets and squares is the lack of garbage cans. "All squares, streets, bus stops, city transportation stops and parks should be equipped with garbage cans. The distance between garbage cans is determined based on the intensity with which a certain area is used, but should not be less than 40 meters on busy streets, and 100 meters on poorly used streets. Cans should be regularly emptied."
Appendix 15: Tariff Policy- Foreign Experience

In many countries with developed economy, local administration bodies regulate prices for utilities. This is done because companies that provide utility services are normally natural monopolists at the level of individual settlements. Experience shows that such practice allows using financial resources, capacity and capabilities of service producers in a more conservative fashion.

In Great Britain, the USA, Sweden and other developed countries, city authorities strive to mitigate the monopolistic status of municipal services through their infrastructure policies. Such innovations can be applicable in the organization of city water, heat, electricity and gas supply, i.e. the services that are technically monopolies. For example, prior to expanding centralized utility systems in small towns, they use individual and group utility units (for water, gas and heat supply).

Such practices could also be used in our country, especially in the areas of new housing construction on the outskirts of major cities. The usage of decentralized HS systems has good future, given the experiences of such countries as Germany, France, etc. It should be taken into account that state regulation of utilities infrastructure is not just discontinued in the countries with developed market economies, but also underwent deep evolution influenced by the specific needs of each individual sector of HUM.

HUM reforms face difficulties and contradictions of moral and psychological nature in all countries. The most painful for the population was universal increase in tariffs for services. At the first stage, in many states, the tariffs were not yet regulated. However, utility-related expenses were growing fast, ahead of general consumer price index and population incomes. In the recent years, the situation has slightly changed: the growth in tariffs slowed down, while real income dynamics witness positive trends. However, their pre-reform level has not been reached everywhere, and the gap between tariffs and the population's ability to pay remains.

Common for all Central and Eastern European countries in the last twenty years are changes in the structure of financing housing construction towards the private sector, changes in the mechanisms of maintaining residential buildings and paying for utility services, as well as in mechanisms of social protection of the population. The most painful for the population was the increase in tariffs for housing and utility services. At the first stage, in many states, the tariffs were not yet regulated. However, utility-related expenses were growing fast, ahead of general consumer price index. Over the recent years, the growth in tariffs slowed down, while real income dynamics witness positive trends. And yet, the gap between tariffs and the population's ability to pay remains. The situation in the utility services market in CEE countries, although similar in some ways, is at the same time quite different.

In Slovakia, for instance, the state still provides large subsidies to utility enterprises. In Poland, associations pay for all of the services (heat, water, electricity, etc.), and deals with non-payers on its own. The maximum deference on the payment is normally three months. Associations execute contracts with local firms providing RSW removal services, maintaining and repairing water pipes and drains. Tariffs for services are approved by state authorities. When determining tariffs, a wide range of criteria is taken into account: structure of buildings, window and door materials, roofs, age of buildings and many others. An average Polish family may spend up to 50% of its income on housing and utilities. At the same time, when it comes to the population's ability to pay, payment of utility services reaches 90%.

Persistent non-payers are subjected to the law on forced eviction. Between 1994 and 1998, 6656 families were evicted. In 5000 cases, eviction was followed with the provision of cheaper housing. However, in 2003, the Constitutional Tribunal recognized the contradiction of certain clauses on
eviction of individuals not paying rent and utilities with the principal law of the country. The same year, it was prohibited to evict pregnant women, children, people with disabilities and their caregivers. The remaining negligent non-payers are still subject to eviction from their residences. Another HUM problem is the huge number of bearing-wall multi-storied buildings, which are gradually falling into disrepair. To-date, every third Polish citizen resides in a multi-storied building constructed in 1970-1980s.

In the majority of countries, tariffs for basic utilities were growing at galloping rates. As a result, housing and utilities are the second expense in family budgets, after food.

<table>
<thead>
<tr>
<th></th>
<th>Increase in the number of PHA's during 2000-2008</th>
<th>Increase in tariffs for power, gas, and other kinds of fuel during 1991-2001</th>
<th>Increase in tariffs for power, gas, and other kinds of fuel during 2001-2008</th>
<th>Share of utilities in the income of an average family of 4 (2008)</th>
<th>Share of utility expenses in the HUM expenses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hungary</td>
<td>2.4 times</td>
<td>14 times</td>
<td>2.8 times</td>
<td>21%</td>
<td>80%</td>
</tr>
<tr>
<td>Poland</td>
<td>2.7 times</td>
<td>18.5 times</td>
<td>2.5 times</td>
<td>19%</td>
<td>67%</td>
</tr>
<tr>
<td>Slovakia</td>
<td>3.2 times</td>
<td>no data available</td>
<td>1.8 times</td>
<td>13%</td>
<td>80%</td>
</tr>
</tbody>
</table>
## Appendix 16: Access of Companies to Utilities (% of sample)

<table>
<thead>
<tr>
<th></th>
<th>Operates with frequent interruptions</th>
<th>Not available or not operational</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>gas supply</td>
<td>running water</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>6.9</td>
<td>5.6</td>
</tr>
<tr>
<td>Agriculture</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Manufacturing and Construction</td>
<td>8.8</td>
<td>4.4</td>
</tr>
<tr>
<td>Transportation and Communication</td>
<td>4.2</td>
<td>16.7</td>
</tr>
<tr>
<td>Services, HUM, Financial Sector</td>
<td>6.6</td>
<td>5.7</td>
</tr>
<tr>
<td>Trade</td>
<td>4.6</td>
<td>8.6</td>
</tr>
<tr>
<td>Public catering</td>
<td>15.7</td>
<td>9.4</td>
</tr>
<tr>
<td>City</td>
<td>8.1</td>
<td>6.5</td>
</tr>
<tr>
<td>UTS</td>
<td>6.2</td>
<td>5.4</td>
</tr>
<tr>
<td>Village</td>
<td>4.9</td>
<td>4.0</td>
</tr>
<tr>
<td>Republic of Karakalpakstan</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Andijan Oblast</td>
<td>12.1</td>
<td>3.4</td>
</tr>
<tr>
<td>Bukhara Oblast</td>
<td>3.5</td>
<td>1.8</td>
</tr>
<tr>
<td>Djizak Oblast</td>
<td>12.3</td>
<td>19.3</td>
</tr>
<tr>
<td>Kashkadarya Oblast</td>
<td>21.4</td>
<td>7.1</td>
</tr>
<tr>
<td>Navoi Oblast</td>
<td>5.3</td>
<td>5.3</td>
</tr>
<tr>
<td>Namangan Oblast</td>
<td>5.4</td>
<td>7.1</td>
</tr>
<tr>
<td>Samarkand Oblast</td>
<td>7.0</td>
<td>3.5</td>
</tr>
<tr>
<td>Syrdarya Oblast</td>
<td>16.1</td>
<td>10.7</td>
</tr>
<tr>
<td>Surkhandarya Oblast</td>
<td>3.6</td>
<td>8.9</td>
</tr>
<tr>
<td>Tashkent Oblast</td>
<td>1.6</td>
<td>3.2</td>
</tr>
<tr>
<td>Fergana Oblast</td>
<td>3.5</td>
<td>0</td>
</tr>
<tr>
<td>Khorezm Oblast</td>
<td>3.5</td>
<td>7.0</td>
</tr>
<tr>
<td>Tashkent City</td>
<td>1.9</td>
<td>1.9</td>
</tr>
</tbody>
</table>

**Source:** 2009 Employer Survey
Appendix 17: Local Budgets and Infrastructure: Foreign Experience

**Germany:** In the provision of social services, government authorities use the principle of providing equal living standards for all citizens of their countries. The scope of federal authority in Germany includes defense, international relations, citizenship issues, emigration and immigration, currency policy, financing and regulating federal transportation, mail and telecommunication services. State authorities cover culture, education, justice and law enforcement, healthcare, as well as regional economic policy. Municipal authorities are responsible for utilities, local healthcare institutions, and sports, construction of housing, roads, and schools. At the same time, the scopes of authority of various level government bodies do not necessarily correspond with their duties in terms of expenses. Expenses in the sphere of social policy and construction of infrastructure objects, for example, are covered from budgets of all levels. There is also a trend of passing expenses down to lower levels of the budget system: presently, municipal budgets finance about two thirds of all government capital expenditure, with the bulk of the responsibility being passed down from upper level budgets.

A second kind of inter-budget leveling is the re-distribution of budgetary resources between state budgets without the interference from the federal government. The criterion for determining who will receive transfers is the estimated regional fiscal potential, which is an aggregate of tax revenues of a regional budget, adjusted for provided tax benefits, and tax revenues of local budgets, which are in turn adjusted for population concentration, degree of urbanization, etc. A leveling ratio is also determined for any individual subject of the Federation, which is calculated as a product of the average fiscal potential for all lands and the population of such individual state. Then, each recipient of financial aid is allocated a transfer provided that its fiscal potential after leveling constituted not more than 95% of the average fiscal potential.

Current budget system in Germany stipulates that each subject of the federation has its own methodology for redistributing resources between municipal budgets. Usually, when developing such methodologies, state authorities first of all proceed from the municipality needs, taking into account the structure of regional economy.

Different level budgets in Germany are entitled to attract borrowed funds to finance their deficits, but there are very rigid restrictions in terms of the attracted amounts, set by the Treaty of Maastricht. The clause of this Treaty that sets limits for the amount of country borrowings was taken from German Constitution, which limits the federal budget borrowings to the planned investment funding from the budget. Such restrictions are also stipulated in the legal acts of individual states on borrowings by their authorities.

**Great Britain:** The responsibilities of municipal bodies in terms of expenses were considerably cut in the process of reforming. Presently, local authorities have no right to construct or acquire housing, and have lost control over some kinds of educational institutions; local transport and utility grids were privatized. This resulted in a significant decrease in their responsibilities in terms of expenses. Revenues of local budgets consist of two taxes: national tax on property, used for commercial purposes, and local tax on property, used by individuals for dwelling. The first tax is not local; its rate, basis and payment procedures are established by the central government. The system of inter-budget leveling in Great Britain is quite complex and is different in different parts of the country. At the same time, allocation of financial aid is based on principles that are common for the entire state. There are two main kinds of financial aid - block-grants (which in England and Wales are called grants for increasing revenues) and special purpose grants.

When talking about Great Britain's budget system, one cannot omit to mention the mechanism of control by the central government over expenses of local budgets (capping), i.e. the mechanism of
controlling expenses of local budgets, which allows the government to reduce the tax base of such local budget, whose expenditure exceeded the level fixed in the documents of the central government.

On the procedure of borrowings for local budgets, one should note that by law, local authorities have no right to raise borrowed funds for financing current expenses. Local budgets have the right to borrow for capital needs, only directly from commercial banks or via a special body — the Public Work Loans Board, which has access to the U.K. National Loans Fund, and therefore can provide loans at better than commercial terms. It is also important that along with restricting the amounts of borrowings, there is a limit on capital expenditure.

So the role of local authorities and local budgets in Great Britain is mostly reduced to ensuring efficient distribution of a fixed amount of financial funds, as set by the central government. In addition to this, certain spending on the local level (including a part of expenses on education and housing and utilities) is controlled by associations of private nature — usually, by agencies that deal with spending, are financed by the central government and are controlled by its representatives.

**Italy:** Five regions out of twenty have special status, which is expressed through constitutional laws that give a lot of independence to these regions in terms of determining what they can spend their budgets on.

Italy's budget system expenses are distributed as follows. Regional budgets are responsible for financing the services of medical institutions, town planning, water supply, as well as road construction and intra-regional passenger transportation. The legislation clearly provides for a possibility for the regional authorities to transfer part of their spending responsibility down to lower levels of the budget system, which is what usually happens, especially in cases of financing housing and utilities or community work. Province budgets bear the costs of financing the construction and maintenance of state roads of regional level, financing water and mountain transportation, environment protection activities, regional educational institutions and cultural establishments (local universities, museums, theaters, etc.).

Main spending items in municipality budgets are maintenance of local police subdivisions, social security system, construction and maintenance of buildings used by judicial bodies and educational institutions, construction, repair and cleaning of municipal streets and roads, providing municipality residents with gas and electricity.

Main revenue sources in regional and local budgets are tax revenues, special purpose and general grants from upper level budgets and borrowed funds. In addition to the above, local budgets revenues include proceeds from some central taxes, with the purpose of stimulating tax efforts of local authorities.

The main part of revenues in budgets of sub national level is funds transferred in the form of grants from upper level budgets. Such grants, or transfers, are differentiated between being of special or of general purpose grants. The latter is quite small broken down by regions, as revenue from general transfers represents only 3% of total revenue of regional budgets. The sources of general grants to regional budgets are two national budget funds — the Common Fund and the Regional Development Projects Fund. Both funds are distributed between regions in proportion with their population, areas and unemployment levels. Substantial part of these funds is sent to southern, less economically developed regions of the country.

General purpose grants allocated to municipal budgets from the central budget, are more versatile; their sources are three different funds, from which transfers are assigned based on various criteria — with the purpose of financing regular current expenses, special expenditure programs (for
instance, youth employment programs) and with the purpose of compensating for insufficient tax base in municipalities.

Along with general purpose grants, Italy has special-purpose grants, which represent the main part of revenues in regional and local budgets. Main sources of such grants are two budget funds — the National Health Fund and the National Transportation Fund.

Regions are allowed to borrow only for the purposes of capital expenditure, provided that the borrowed amounts taking into account debt service should not exceed 25% of the budget's own revenues. Regions can borrow both from commercial banks, and from the Depositary and Loan Fund, whose funds are provided on a return and fee paid basis. An important feature in the Italian budget system is that the central government is liable under the arrears of sub national budgets, which are covered through periodical clearing procedures between different level budgets.

Overall, the distinctive feature of federal state budget systems is, above all, that federal authorities, i.e. the second tier of authority after the central government, have much more independence in terms of setting tax rates and introducing new taxes, distributing spending responsibilities and using their own budget funds.

In countries with federal form of government, the spending responsibilities of federal subjects are much wider than of their counterparts within unitary states - in unitary states, it is typical to have uniformity in taxes, payments and budget processes throughout the country, while in federal states these parameters could differ from each other throughout various federal subjects depending on regional legislation.

The analysis indicates that in theory, lower level budgets in unitary states are intermediary funds for the distribution of central government resources and accumulation of those resources, whose administration at this level is deemed most efficient. In unitary states, versus federations, the central government is liable for the arrears of lower level budgets, as well as sets ceilings on the amounts and terms of borrowings. Also, for unitary states it is typical to have high (over 50%) share of central budget funds as the revenue in lower level budgets.
Appendix 18: Demographic Trends

<table>
<thead>
<tr>
<th>Year</th>
<th>Average listed population of Uzbekistan (thousand people)</th>
<th>Average listed urban population (thousand people)</th>
<th>Share of urban population (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1996</td>
<td>23,127.7</td>
<td>8,948</td>
<td>38.7</td>
</tr>
<tr>
<td>1997</td>
<td>23,560.5</td>
<td>9,063</td>
<td>38.5</td>
</tr>
<tr>
<td>1998</td>
<td>23,953.9</td>
<td>9,156</td>
<td>38.2</td>
</tr>
<tr>
<td>1999</td>
<td>24,311.6</td>
<td>9,235</td>
<td>37.9</td>
</tr>
<tr>
<td>2000</td>
<td>24,650.4</td>
<td>9,295</td>
<td>37.7</td>
</tr>
<tr>
<td>2001</td>
<td>24,964.4</td>
<td>9,357</td>
<td>37.5</td>
</tr>
<tr>
<td>2002</td>
<td>25,271.8</td>
<td>9,411</td>
<td>37.2</td>
</tr>
<tr>
<td>2003</td>
<td>25,567.7</td>
<td>9,451</td>
<td>36.9</td>
</tr>
<tr>
<td>2004</td>
<td>25,864.4</td>
<td>9,512</td>
<td>36.8</td>
</tr>
<tr>
<td>2005</td>
<td>26,167.0</td>
<td>9,565</td>
<td>36.5</td>
</tr>
<tr>
<td>2006</td>
<td>26,488.2</td>
<td>9,605</td>
<td>36.2</td>
</tr>
<tr>
<td>2007</td>
<td>26,868.0</td>
<td>9,648</td>
<td>35.9</td>
</tr>
<tr>
<td>2008</td>
<td>27,302.7</td>
<td>9,698</td>
<td>35.5</td>
</tr>
<tr>
<td>2009</td>
<td>27,767.1</td>
<td>14,236</td>
<td>51.2</td>
</tr>
<tr>
<td>2010</td>
<td>28,233.4</td>
<td>14,596</td>
<td>51.7</td>
</tr>
<tr>
<td>2011</td>
<td>28,540.0</td>
<td>14,659</td>
<td>51.4</td>
</tr>
</tbody>
</table>

Source: State Statistics Committee of the Republic of Uzbekistan

Appendix 19: Statute on Department for Managing City Infrastructure

1. The Statute shall determine the status, functions, tasks, rights and responsibilities of the city administration (khokimiat) department for managing city infrastructure.
2. The main directions in the activities of such department shall be the provision of quality maintenance and development of the city infrastructure in accordance with modern-day requirements.
3. Such department shall be the sole customer in all spheres of the construction, capital repair, modernization, technical and technological upgrading of the city infrastructure objects. It shall be governed by the Constitution and the laws of the Republic of Uzbekistan, the decrees, resolutions and orders of the President of the Republic of Uzbekistan, the resolutions and orders of the Cabinet of Ministers of the Republic of Uzbekistan, decisions of the Kengash (Local Parliament), and resolutions and orders of the city governor (khokim), as well as by this Statute.
4. Such department shall be a legal entity. It shall have an independent balance sheet, a stamp and a letterhead with the State Emblem of the Republic of Uzbekistan, with its own name in the state language, and a current account in a bank.
5. The founder of such department shall be the city authorities, which, pursuant to the effective legislation, shall have the right to:
   - appeal to court with claims against unlawful activities under contracts concerning the department's property;
   - withdraw the department's property that is excessive, unused or used for purposes other than intended;
   - file claims with respect to organizations or institutions on the damage inflicted thereby upon the department;
   - approve annual operational plan of the department and hear reports on completed work;
   - exercise control over the state property transferred for the use of the department, and protect the same from disposition.
6. The property of such department shall be formed from the property that belongs to the founder of the department. This means that all of water supply, sewage, heat, gas, and electricity supply objects located within the territory of the city (district) shall be transferred into the ownership of the respective authorities, in a manner established by the legislation.

7. The main tasks of the department shall be:
   - to organize the implementation of works to maintain and operate infrastructure objects, transferred into its disposal, in accordance with architectural, construction and sanitary norms and rules, including;
   - to form the balance between the production and consumption of utility services and organize the provision of quality services to the population;
   - to coordinate the activities of the city infrastructure enterprises, exercise control over the implementation of contractual terms on maintenance and operation of infrastructure enterprises;
   - to ensure the collection of subscriber fees for utility services, develop advanced forms of contractual relations between the suppliers and consumers of utility services;
   - to ensure the introduction of "One-Stop Solution" services;
   - to ensure intended and efficient use of budget funds for city infrastructure development projects;
   - to raise off-budget funds, and other funds, not prohibited by the effective legislation, for the maintenance and development of city infrastructure.

The department shall perform the following functions
- forming demand for utility services based on the approved town-planning documentation and sanitary and hygienic norms, set by the Government of the Republic of Uzbekistan;
- taking decisions on transferring infrastructure objects into third-party management;
- organizing control and annual technical evaluation of the physical condition of urban amenities;
- taking decisions on the procurement of products (utility services);
- controlling the implementation of contracts and paying supplier bills;
- organizing recording of individual and legal entity subscribers of utility services, entering into contracts with them in an established manner, protecting their interests, collecting payments for utility services in an established manner;
- entering into agreements on conducting repairs of objects according to design and estimate documentation and address lists, approved in an established manner;
- developing activities to introduce new technologies, automation and mechanization devices;
- ensuring efficiency and transparency of budget spending, organizing rational usage of goods and materials, electric power and monetary assets, their recording, as well as financial reporting in accordance with the effective legislation;
- estimating annual demand and distributing budget funds within established parameters.

Control over the operations of the department shall be exercised by the founder and other authorized bodies in a manner, established by the legislation.

The department's operations shall be financed from the local budget and allocations from renting infrastructure objects and payments for utility services.

The department shall report to the deputy governor of the city (district), in charge of the issues of construction, utilities, architecture, transport and communications.
THE STRUCTURE
of the city infrastructure management department in large and major cities

- Head - 1 person
- Deputy head – 2 persons
- Forecasting and planning unit - 6 persons
- Subscriber relations unit - 3 persons
- Contract unit - 3 persons
- HR unit - 1 person
- Bookkeeping and support personnel - 4 persons

Assessment of Prospects for Transition to "Green" Economy

<table>
<thead>
<tr>
<th>&quot;Green&quot; direction</th>
<th>Losses due to lack of &quot;green&quot; economy in the sector</th>
<th>Proposed investment</th>
<th>Required annual investment</th>
<th>Equipment pay-back period</th>
<th>Benefits from introducing &quot;green&quot; technologies</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;Turning HUM sector green&quot;</td>
<td>Losses due to lost opportunity of exporting natural gas = $1.865 billion</td>
<td>Modernization of heat unit (outside heat insulation and thermostats, upgrade of pipe system)</td>
<td>$60 million</td>
<td>16.3 years</td>
<td>- conserved heat energy and hydrocarbons (mostly natural gas) - saving thanks to the reduction and further discontinuation of subsidies on natural gas - reducing annual emission of carbon dioxide - improving living standards and cutting costs of utility services in rural areas - opportunity to accumulate excessive energy and even usage throughout a year - creating 15,000 new jobs in the energy-efficient construction sector by 2020</td>
</tr>
<tr>
<td></td>
<td>Losses due to lost opportunity of receiving additional financial resources from selling CO2 quotas under CDM = $250.3 million.</td>
<td>Introducing technologies of passive solar heating</td>
<td>$13.7 million</td>
<td>4.1 years</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Wide usage of renewable energy sources in buildings.</td>
<td>$46.1 million</td>
<td>6.65 years</td>
<td></td>
</tr>
<tr>
<td>Improving waste management</td>
<td>Losses due to lost opportunity of receiving additional financial resources from selling CO2 quotas under CDM = $11.6 million.</td>
<td>Improvement of existing landfills and construction of garbage recycling plants</td>
<td>$85 million p.a.</td>
<td>5 years</td>
<td>- reduced emissions of carbon dioxide - recycling and circulation of products - creating additional &quot;green&quot; jobs (17,500 people at GRP and 100 thousand people in waste collection cooperatives)</td>
</tr>
<tr>
<td></td>
<td>Lost opportunity due to lack of processing RSW = Losses due to lost opportunity of receiving additional financial resources from selling CO2 quotas under CDM = $600 million.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>