

The current state of the public water supply and wastewater disposal market in Russia

Prof. Dr. Evgeny Pupyrev, Head of the Expert-Technological Board of the Russian Water and Wastewater Association

WASSER BERLIN INTERNATIONAL, 28.03. 2017

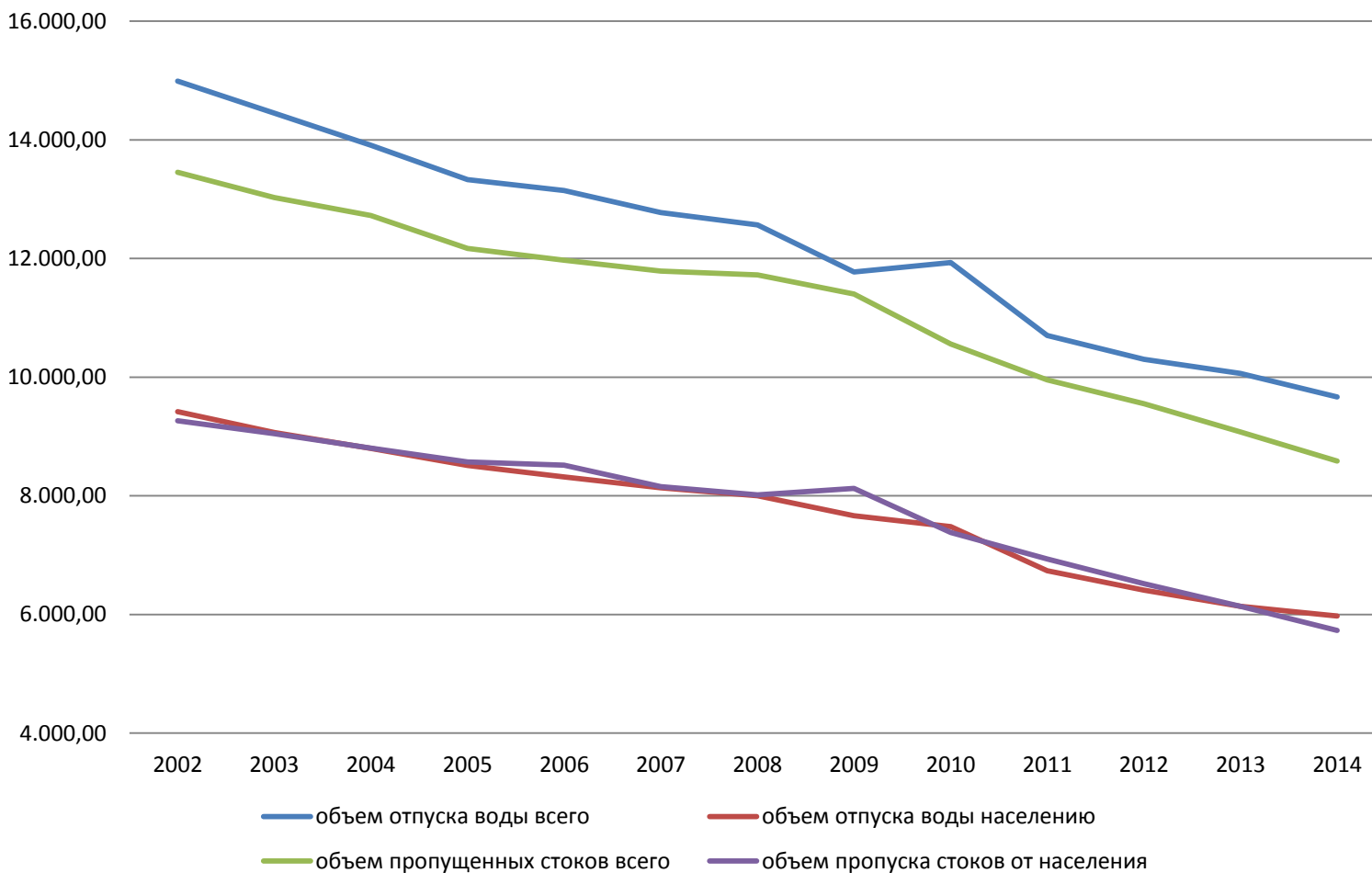
Russian Cities

City groups	Population, ths. people	Number of cities per group	Total population, ths. people
Megacities	Over 1000	15	32080
Largest cities	500-1000	21	12755
Large cities	250-500	38	13450
Large towns	100-250	91	13895
Mid-sized towns	50-100	132	10704
Small towns	Less than 50	781	16142

Water Treatment Plants in Cities

No.	Cities	Population, ths people	Capacity of WTP ths. cub. m. per 24 h.
1	Small towns	Less then 50	Up to 5
2	Mid-sized	50 - 100	Up to 15
3	Large	Over 100	Over 15

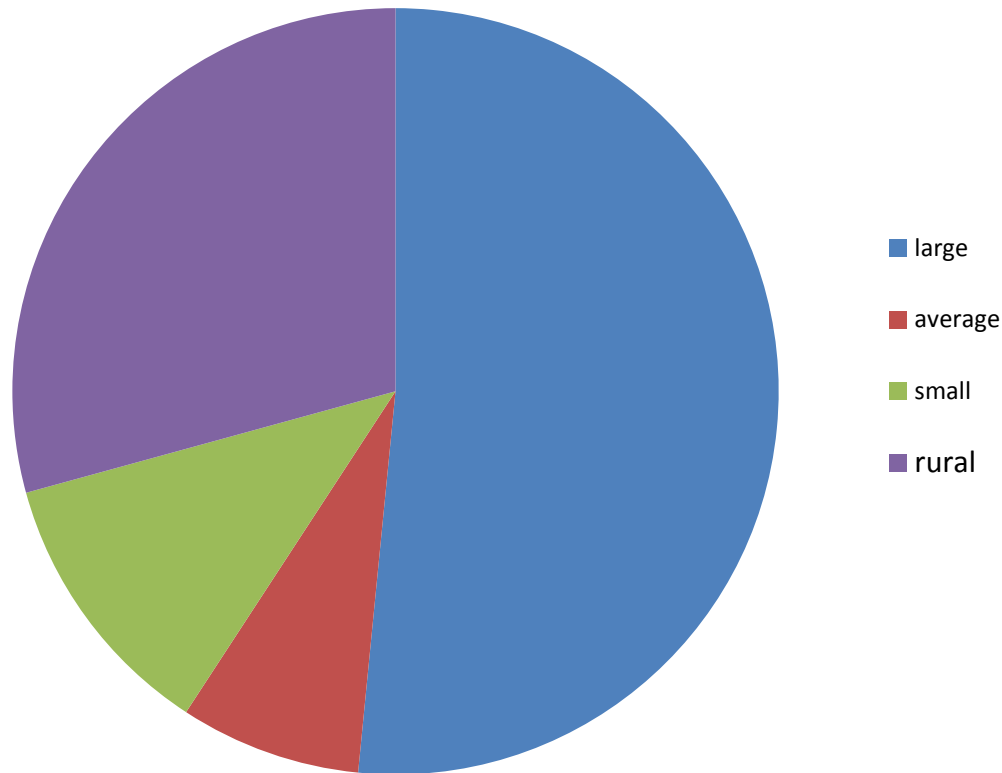
Dynamics of consumption of services in the water sector, mln cub.m.



Drinking Water Quality Standards in Russia

	Units	Raw water	Drinking water
Turbidity	mg/l	max. 100	0,4
Color	degree Cr/Co	max. 100	11
Odor	point	4	1
Hydrogen exponent	pH units	7.3 – 8.9	7.1
Permanganate value	mg/l	max. 16	3.7
Aluminium	mg/l	-	0,08
Chloroform	µg/l	-	14
Iron	mg/l	max. 1.7	0.07
Manganese	mg/l	max. 0.4	0.02
Total microbial count	CFU/1ml	max. 23000	0 – 5
Total coliforms	CFU/100 ml	max. 6100	Absent
Thermotolerant coliform bacteria	CFU/100 ml	max. 6100	Absent
Spores of sulfite reducing Clostridia	CFU/20 ml	max. 30	Absent
Coliphages	PFU/100 ml	max. 300	Absent

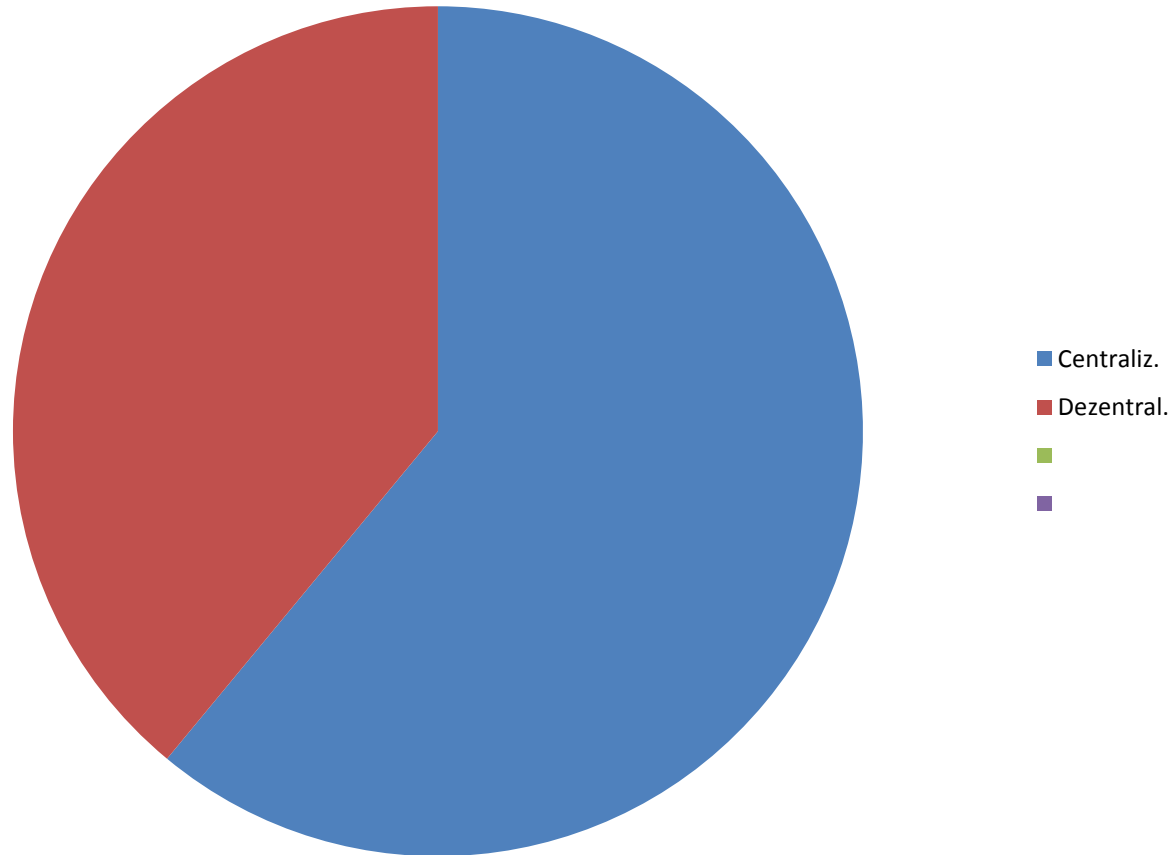
Water Supply in Russia



The Quality of Wastewater in Russian Settlements

Wastewater composition indices, mg/dm ³	Settlement Types					
	Rural		Small towns		Large cities	
	At the intake of WWTF	After treatment	At the intake of WWTF	After treatment	At the intake of WWTF	After treatment
Suspended solids	250-300	12-20	200	10-15	250	3-8
BOD _{tot}	250-300	15 - 20	250	5-15	250	3-7
Ammonia nitrogen	До 40	5-7	30	1-2	30	0.39-1
Nitrite nitrogen	-	-	0.1	-	-	0.1
Nitrate nitrogen	До 10	15	5.0	12-15	-	9.1-15
Phosphorus (P)	2-4	1-2	3	1-2		0.2-1
Petroleum products	4	1	4-7	0.5	4	0.05-0.5
Synthetic surfactants		1	4	0.80	4	0.2
Mineralization	-	-	1000	1000	1000	1000
Chlorides	-	-	300	300	300	300
Sulphates	-	-	100	100	100	100
Trivalent chromium	-	-	0.5	0.3	0.5	0.3
Nickel	-	-	0.25	0.1	0.25	0.1
Copper	-	-	0.1	0.05	0.1	0.05
Zinc	-	-	0.3	0.20	0.3	0.2
Lead	-	-	0.05	0.03	0.05	0.01

Waste Water Treatment in Russia



Luberetsky Wastewater Treatment Facilities

3 million m³/day capacity



Small Wastewater Treatment Facilities

Mezhdurechie Community



The current situation

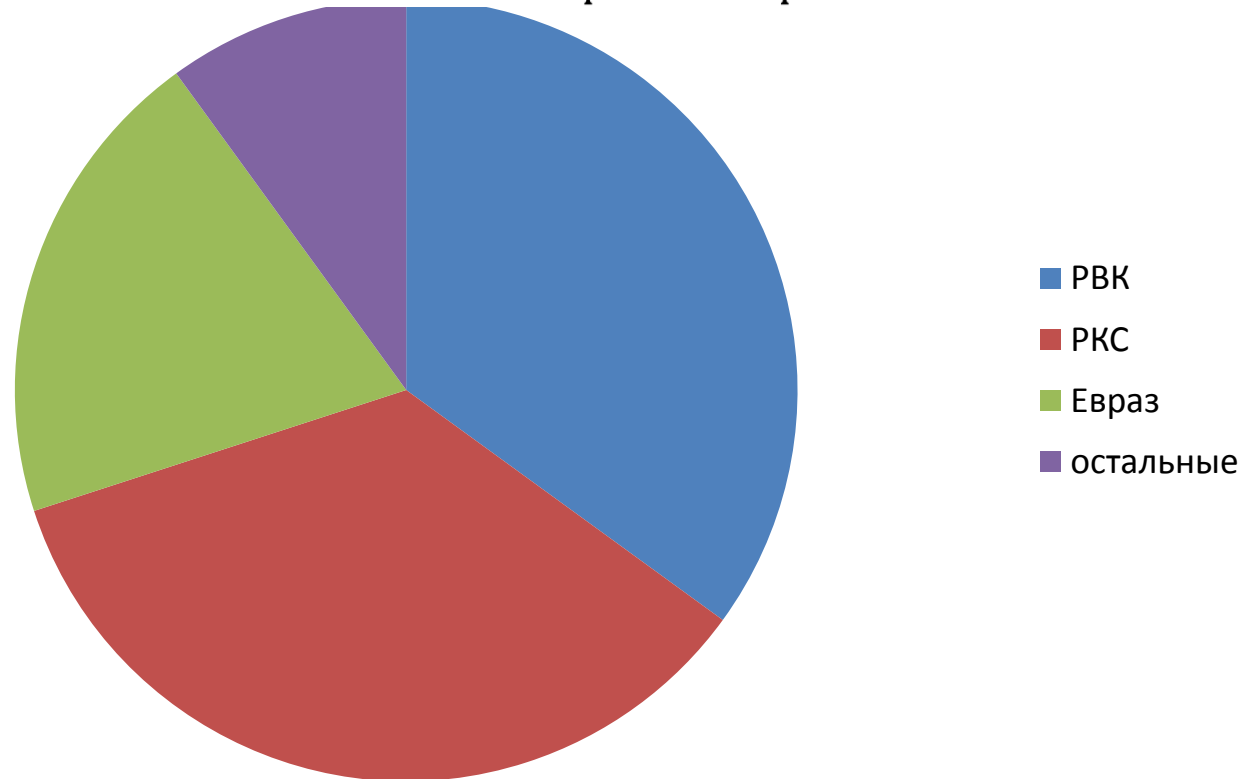
- There are cases of supply of unsafe potable water in urban areas.
- There is no control over the quality and quantity of potable water in rural settlements.
- The centralized WWT system is insufficiently developed.
- Everywhere there is a lack of purification of domestic wastewater.
- In 2008, a group of experts has developed the concept of the federal program “Clean Water”. In accordance with this program, about 15000 bln. rubles are required for the modernization of water supply and WWT system in Russia.

Management in Water Supply and WWT

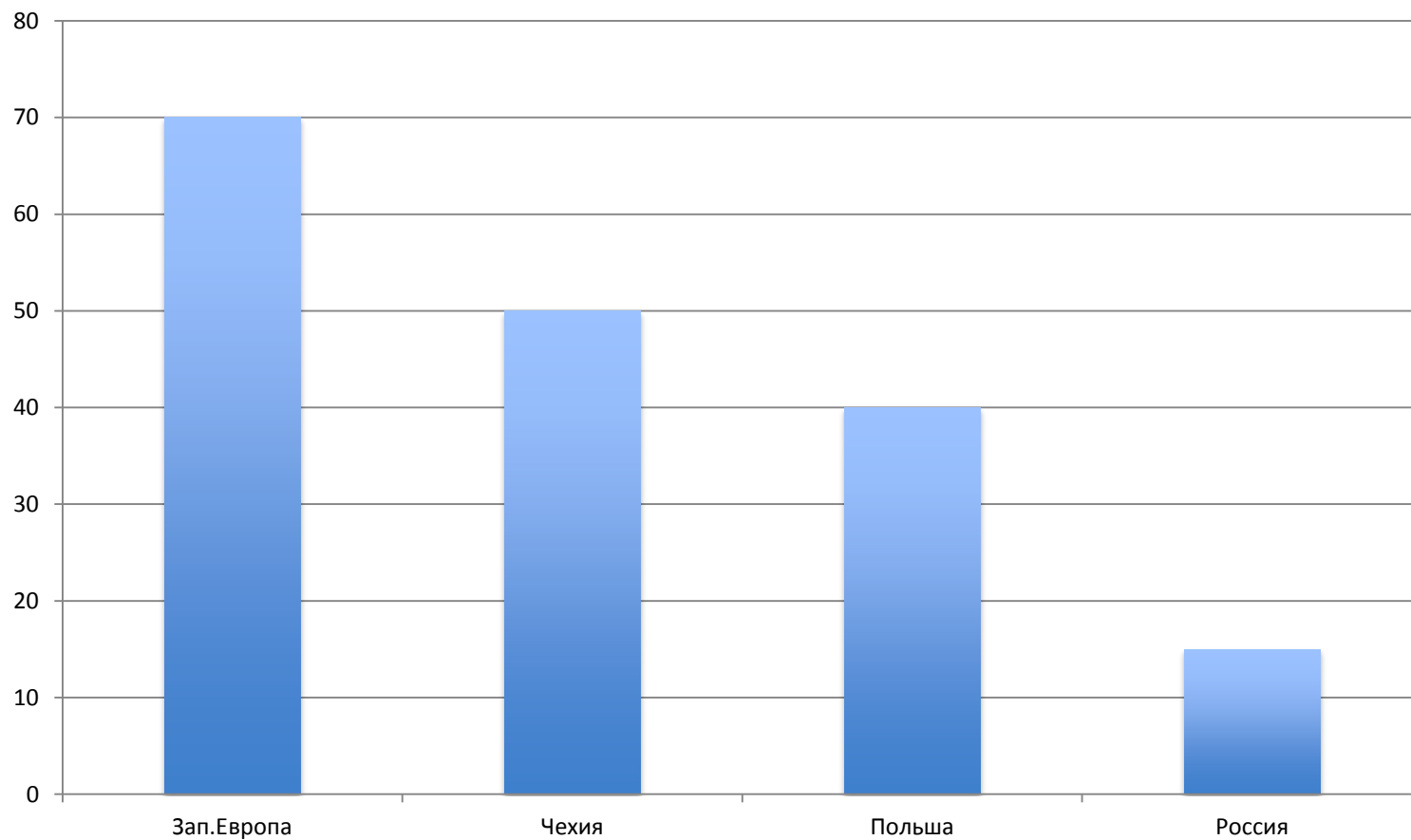
- The share of the construction industry and housing and communal services accounts for 17% of Russia's GDP
- 98.2% of enterprises in civil engineering are privately owned. In the designing stage 64 % of organizations are small private enterprises.
- Population annually refunds the acquisition of property and payment of housing and communal services in the amount of \$ 7 trillion rubles. Only 349 billion is got for the country's water supply and sanitation system.
- 14,600 water operators currently work in the Russian Federation.

Private market of Water Management of Russia

11% of the market is accounted for the first three private companies



Consumption of bottled water l/day per p.



Management in Water Supply and WWT

- The management of water supply and sanitation in Russia is decentralized, develops in the direction of concession agreements.
- Most of water operators are private, but most of population continues to enjoy the services of municipal enterprises.
- The tariff policy is under the control of federal departments and taking into account the financial features of the city or rural settlement, the upgrade or new construction of facilities and networks can be partially or fully subsidized from public funds.

Problem of Import Substitution in large Cities

Of the 40 items of the main waterworks equipment, about 10 do not have domestic counterparts, about 15 have domestic analogues of inadequate quality

The total number of items of basic equipment WWT is more than 60, of which about half (28 items) - imported equipment.

The domestic industry produces a part of equipment, but its reliability is greatly inferior to Western European equipment.

Ultraviolet disinfection, Novosibirsk 60000 cub. m./day



UFA, sewage collector, Polyplastic Group



Lubertsy, Moscow

Mini-Thermal Power Station in Moscow



The Panorama of WWTP in Cherepovets

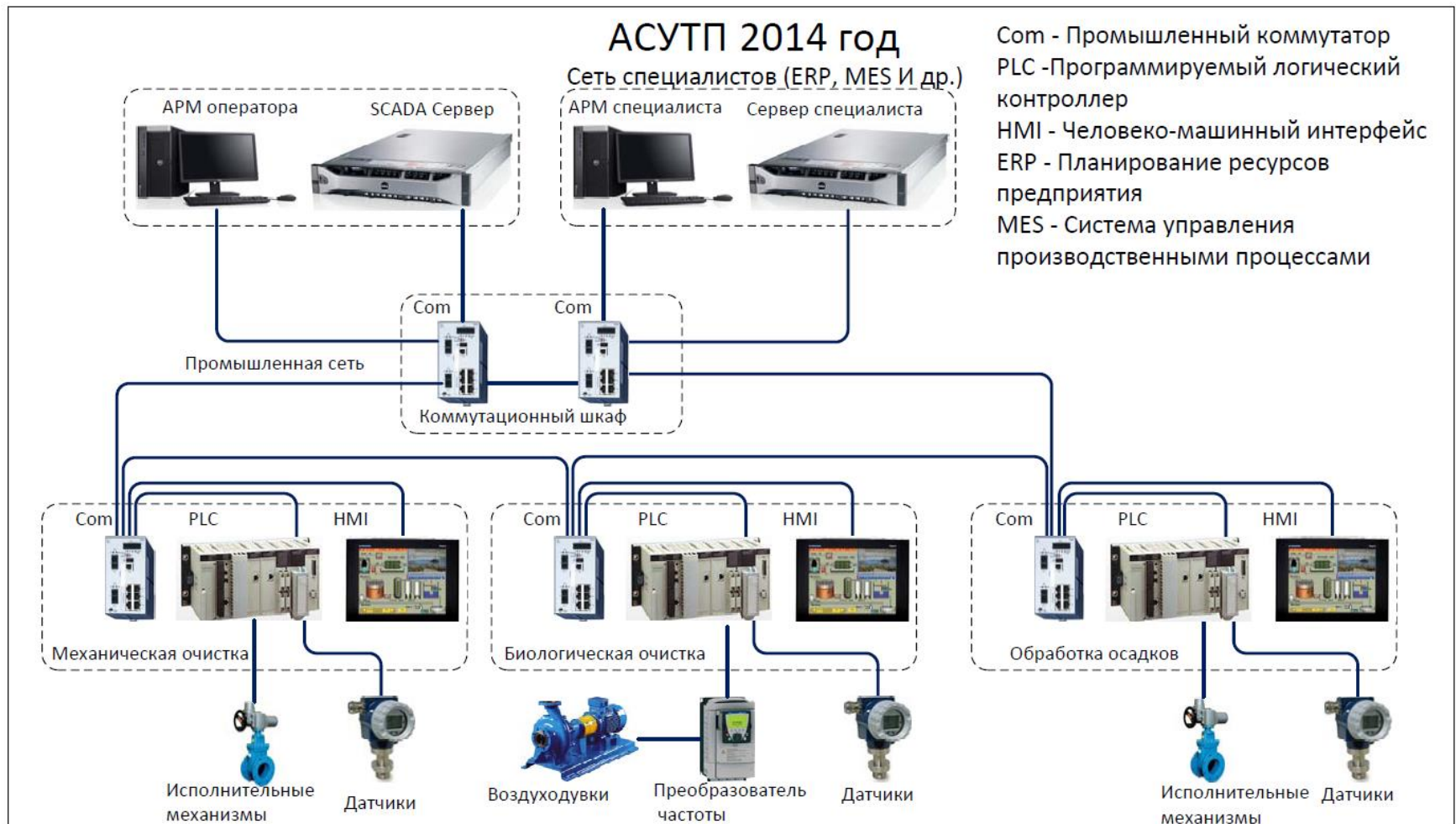


Sludge Treatment

Wastewater Treatment Facilities in the city of Ufa. Sludge treatment complex



Automatic control of water purification



Small treatment plants

1. In the market of small treatment plants dozens, up to hundreds of producers, such as Unilos, Ekos-Samara, Hidroaudit, Termit, Promstoki, Argel, Alta Group, Ekotex-Moskva etc.
2. The sector of small treatment plants is constantly expanding, covering resorts, shopping centers, industrial enterprises, recreational areas.

Small Wastewater Treatment Plants

Wastewater Treatment Facilities in a settlement
(1 500 m³/day, “Rosecostroy”)



Russian Water and Wastewater
Association

Small WWT: Ekos pumping station, Alta Group WWT



The technical aspects of water management in Russia.

- Russia is open for Worlds Knowledge
- the world experience was used in the construction of several major structures;
- reduced engineering, scientific, and educational potential;
- quickly developing market for the production of small waste water treatment plants;
- rapidly developing manufacturing equipment and reagents;
- in a crisis happens the search for innovative technical solutions.

The efforts of the state in crisis

- Concentration of production, engineering, scientific potential;
- Attracting private capital;
- Support of the domestic manufacturers