

# **Khokimiyat of the city of Tashkent**

## **Energy Saving and Energy Efficiency in the Housing in Utilities Sector of Tashkent**

# Heat Supply

- Heat energy is produced by three utilities
- OJSC ««Toshkent issiqlik markazi» - heat energy producer
- OJSC ««Toshkent issiqlik elektr markazi» - heat energy producer
- UE PA “TOSHISSIQQUVVATI” – key heat energy buyer and supplier to customers

# Heat Supply

- **OJSC ««Toshkent issiqlik markazi»» has 9 big heating plants of total capacity 4880 Gcal/hour**
- **There are 51 boilers installed at the heating plants, including: 14 boilers, 50 Gcal/hour each,  
31 boilers, 100 Gcal/hour each,  
6 boilers, 180 Gcal/hour each**

# Heat Supply

- **OJSC ««Toshkent issiqlik elektr markazi»»** has 12 boilers of total capacity 710 Gcal/hour
- Turbogenerator of capacity 30 MW
- In 2013 a project to install a gas turbine equipment was completed

# Heat Supply

- **UE PA “TOSHISSIQQUVVATI”**  
has 4 big heat sources with total capacity of  
640 Gcal/hour
- There are 21 boilers of capacity 20 to 100  
Gcal/hour installed

# Heat Supply

- Heat energy is supplied to the customers via the heating networks (length of ducts - 1354 km or pipes - 2708 km, out of these ducts 901,2 km underground, 453,3 km overhead)
- 258 km of major transmission networks
- 1096 km of distribution networks
- The networks have 30 228 shut-off valves, 4013 sliding slip joints
- 11127 heat chambers and 24145 manholes

# Heat Supply

- Total connected load is 3630 Gcal/hour, out of that 67% - residential, 22% - community infrastructure, 11% - other facilities
- There are 13190 buildings connected, including 9155 residential buildings, 622 health care facilities, 483 schools, 600 kindergartens, 598 higher and specialised secondary educational establishments, 1732 other buildings

# Heat Supply

- Heating utilities annually develop energy saving and energy efficiency measures that are approved by the khokimiyat (city administration)
- Programme foresees overhauls and boiler replacement
- UE PA “TOSHISSIQQUVVATI” replaced 2 boilers in local boiler houses in 2013
- Relaying worn-out pipes of total length 35,4 km



# Heat Supply

- UE PA “TOSHISSIQQUVVATI” achieves natural gas savings thanks to performance and adjustment works, boiler replacement and introduction of solar units

<b>Year</b>	<b>Planned natural gas consumption (000 m<sup>3</sup>)</b>	<b>Actual consumption (000 m<sup>3</sup>)</b>	<b>Economic effect (000 sums)</b>
2000	1558,5	701,76	19423,1
2005	1890,2	748,7	23148,6
2010	675	461,9	25477,38

# Heat Supply

- Heat energy savings are achieved by replacing worn-out heating networks, insulation restoring, liquidation of scenes of sinking, installation of local boiler houses, reconstruction of pump stations, heat substations

<b>Year</b>	<b>Planned savings (000 Gcal)</b>	<b>Actual savings (000 Gcal)</b>	<b>Economic effect (000 sums)</b>
2000	53,9	107,8	437917
2005	210,6	211,5	1479955,7
2010	63,37	76,3	960800,7

# Heat Supply

- Electricity savings are achieved by cleaning of lighting fixtures, observing the schedule of switching lights on and off, use of equipment according to the schedule, sound maintenance of equipment

<b>Year</b>	<b>Planned savings (000 kW)</b>	<b>Actual savings (000 kW)</b>	<b>Economic effect (000 sums)</b>
2000	590,9	590,9	8548,7
2005	1550,3	1564,5	43292,3
2010	2910,9	2422,2	139936,3

# Heat Supply

- Heat energy supplied by UE PA “TOSHISSIQQUVVATI” to consumers annually

Year	Output (000 Gcal)	By consumer category		
		Population	Community infrastructure	Other
2000	754,1	519,3	124,62	30,47
2005	1038,2	710,3	162,1	37,68
2010	1042,4	763,25	153,0	32,33

# Heat Supply

- According to report of proceedings №35 at meeting of the Cabinet of Ministers of the Republic of Uzbekistan of 16<sup>th</sup> of February, 2013 about improvement of heat supplies in Tashkent, it was decided to develop a proposal on transferring with attraction of foreign investments the buildings in the area of HP-8 of OJSC “Toshkent issiqlik markazi” to a closed system
- Heat energy from HP-8 is delivered to 1010 building connected to its network, namely: 830 residential buildings, 30 health care facilities, 28 schools, 37 kindergartens, 28 educational establishments, 57 other buildings.
- In 830 residential buildings there are 29966 flats with total heated area of 1’122’434,45 sq. m with 79’293 inhabitants.
- UE PA «Toshissiqquvvati» estimates the project will cost 138,22 bln sums taking into account 143,82 bln sums for reconstruction of water supply networks.
- Implementation of this project would allow savings of 134 000 Gcal of heat energy, 17834,35 thousand m<sup>3</sup> of natural gas, reduction in emissions by 33,8 thousand tonnes.

# Heat Supply

- OJSC ««Toshkent issiqlik markazi» has installed modern metering devices on all the heat sources:
- of heat energy – ultrasonic meters SVTU-10M
- of natural gas – automated gas metering system «Avtopilot»
- of electricity – digital meters «Evroalpha»

# Heat Supply

- During 11 months of 2013 6862,7 thousand Gcal of heat energy is supplied
- Used: natural gas - 918,2 mln. m<sup>3</sup>, electricity - 244,1 mln. kWh
- Gas consumption per 1 Gcal of heat energy is 133,7 m<sup>3</sup> against planned consumption of 136,2 m<sup>3</sup>
- Electricity consumption per 1 Gcal of heat energy is 35,6 kWh against planned consumption 35,9 kWh
- Natural gas savings January through December 2013 are 17,2 mln. m<sup>3</sup>
- Electricity savings are 2,1 mln. kWh

# Heat Supply

- Resolution by the President of the Republic of Uzbekistan №2069 of 18 November, 2013 foresees the implementation of an investment project to introduce a modern resource saving technology for cogeneration of electricity and heat at HP-4
- Foreseen is the construction of 4 gas turbine units of capacity 27 MW each, that enables electricity output of 108,6 MW, additional heat energy capacity on flue gases 160 Gcal/hour
- Release of capacity of SJSC «Uzbekenergo» is 67357-71094 MW/year, used for needs of HP-4



# Water Supply and Sewage

- MUE “Suvsoz” performs water supply to Tashkent
- Total capacity of city’s water supply facilities amounts to 2326 thousand m<sup>3</sup> per day
- Length of water supply networks is 3631,0 km, including 636,3 km of water conduits and 2994,7 km of distribution networks
- In the networks there are 297 pump stations
- The sewage system is 2618,12 km long and includes 203,7 km of collectors and 2414,4 km of sewage networks
- There are 23 sewage pump stations

# Water Supply and Sewage

- To ensure delivery of fresh water to the upper floors of high rising residential buildings there are over 140 pump stations of third lifting that operate with electrical engines of capacity from 15 to 315 kW.
- In 2009 these pump stations saw the installation of 26 frequency to current converters, resulting in electricity savings of 5884091 kWh as compared to the previous year
- In 2011 46 pump stations had 55 frequency to current converters installed and electricity savings were 4414 thousand kWh

# Water Supply and Sewage

- Currently the 46,94 mln USD investment project «Improvement of the sewage system in Tashkent» with the participation of the Islamic Development has started
- Purchase of 3 sets of laboratory equipment to analyse and monitor sewage water is envisaged
- Reconstruction of 3 city's sewage treatment facilities
- Construction of discharging collector 6,5 km long
- Quality of treatment of 338000 thousand m<sup>3</sup> of sewage water is expected, reduction in electricity consumption by 10-20%

# Water Supply and Sewage

- In compliance with the Resolution of the President of the Republic of Uzbekistan №179 of 25<sup>th</sup> June, 2013 On measures on upgrading and introduction of modern energy saving technologies in the water supply and draining systems of Tashkent it is envisaged to purchase 239 sets of process pumping equipment by «Grundfos» with frequency to current converters worth of 3456,1 thousand euros
- The project will save 20 mln. kWh of electricity annually

# City Street lighting

- Operation and maintenance of the electricity networks of the street lighting in Tashkent is performed by **MUE «Toshshakharnur»**
- As of 1<sup>st</sup> January, 2013 the total number of lighting units was 124743
- The length of the electricity networks is 3443,4 km
- The total installed capacity is 28306,8 kW
- Average annual electricity consumption is 64,5 mln. kWh

# City Street Lighting

- With a view of electricity saving some pilot projects use different lighting technologies (light-emitting diodes, solar panels), installed in sets of 10-20 panels and test technical parameters and ensuring luminosity norms
- Currently in line with Resolution of the President of the Republic of Uzbekistan №ППП-2078 of 28<sup>th</sup> November, 2013 it is envisaged to start the investment project “Introduction of energy efficient technologies into the street lighting system of Tashkent» with participation of the Islamic Development Bank
- The project value is 38,9 mln. USD

# City Street Lighting

- The project will replace 116083 outmoded, mercury-containing lights with modern energy efficient lights
- Replace 1546 power supply cabinets with the introduction of the automatic street lighting control and monitoring system
- **The project will:**
- Reduce the annual electricity consumption by 33,9 mln. kWh, equivalent to 50,3% of the actual consumption, reduction in monetary terms is 1,8 mln. USD
- Reduce emissions by 35% at electricity generation
- Reduce the volume of production of mercury-containing waste of Class 1 of Hazard by 84,5%