



**БИШКЕКЖЫЛУУЛУКТАРМАГЫ АКК**  
**ОАО БИШКЕКТЕПЛОСЕТЬ**

# District Heating Efficiency and Reliability Improvement in Bishkek

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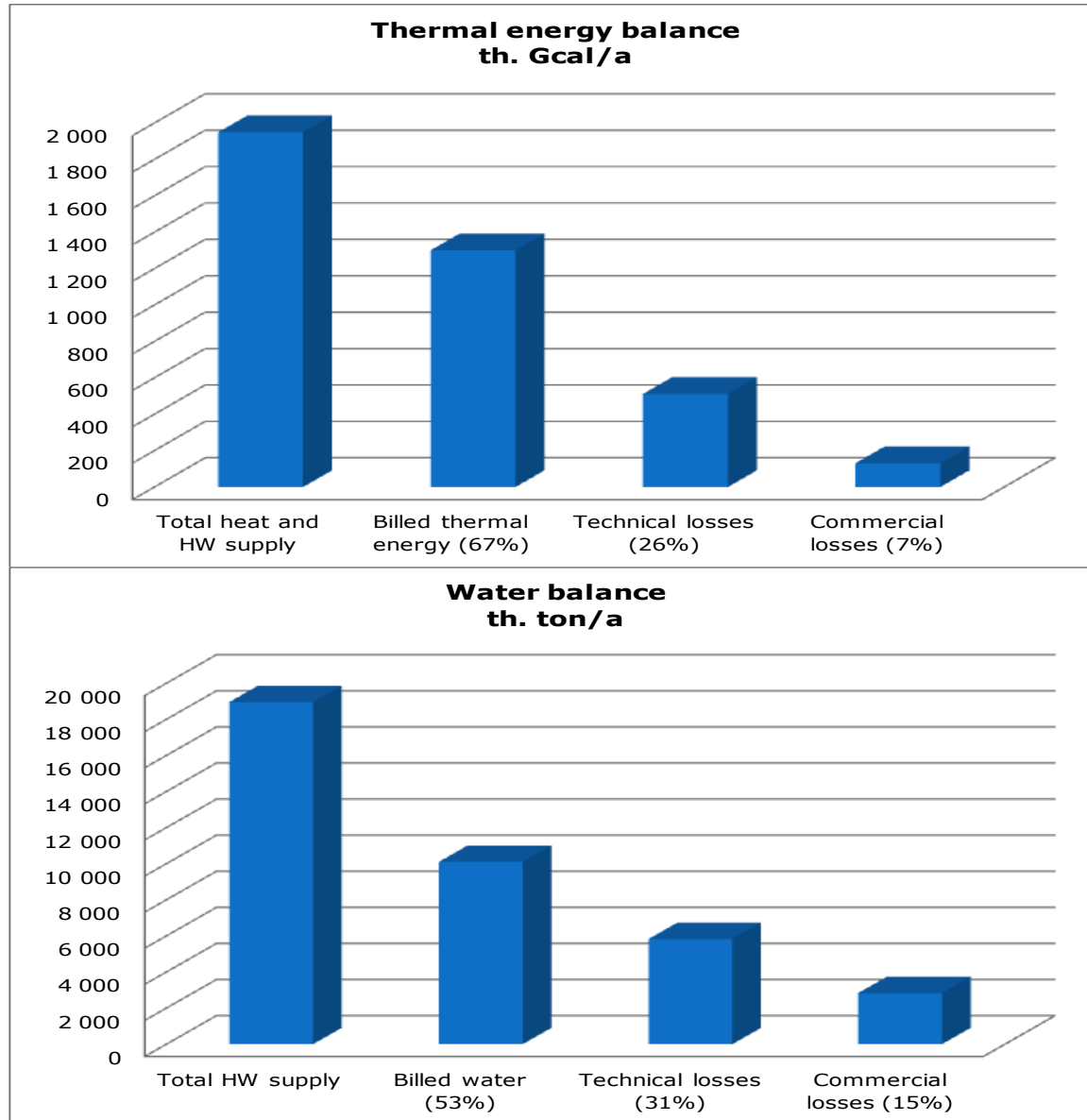
# KYRGYZ REPUBLIC – key facts



# District heating in Bishkek

- ❑ OJSC “Bishkekteploset” has been established in 1963
- ❑ In 2016 BTS supplied a total of **1.3 million Gcal of heat** and **9.2 million tons of hot water** covering **~80-85% of all residential** multi-apartment buildings in Bishkek.
- ❑ BTS operates **454,1 km** of two-pipe heat supply networks
- ❑ **19 pump stations** in an open system mode

# Key challenges to be addressed



# Key challenges to be addressed

- ❑ Increase in breakdowns and deteriorating supply reliability
- ❑ Inadequate quality of service to customers
- ❑ Lack of incentives for energy efficient consumer behavior
- ❑ Constrained DH system transmission capacity
- ❑ Poor system control

# The World Bank Heat Supply Improvement Project (HSIP)

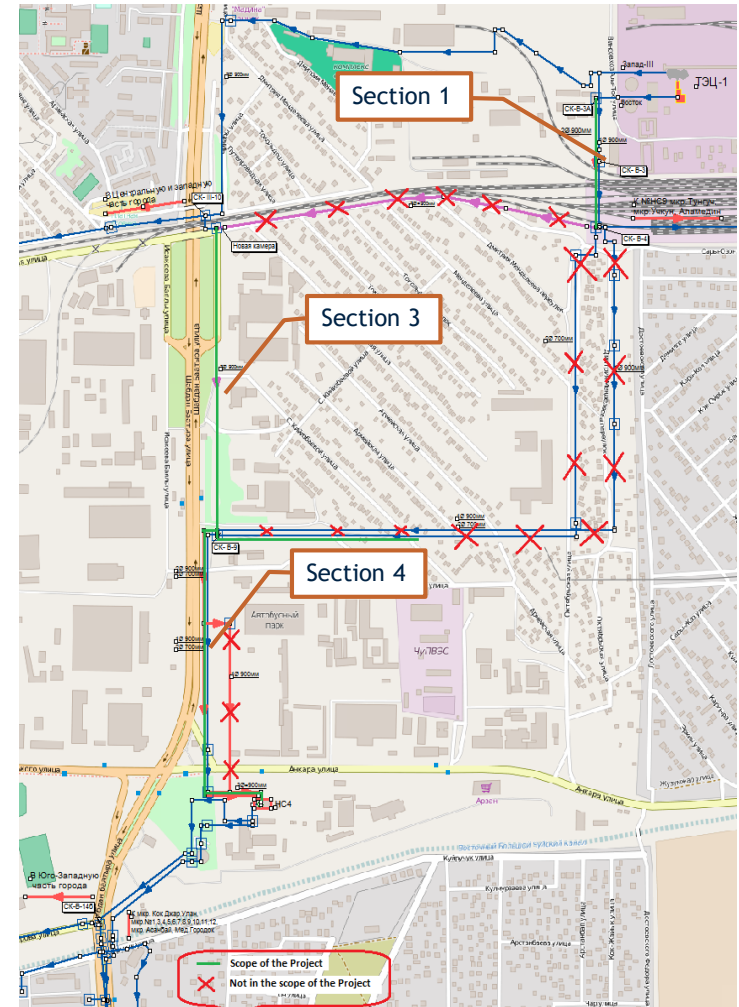
- ❑ Agreement signed between WB and KR in January 2018
- ❑ USD 31 million to be used for priority investments and capacity building, procurement of goods and works
- ❑ The two priority investment packages include:
  - **Package 1:** Modernization of individual heat substations (IHS) at building-level, and installation of metering equipment (estimated USD 21 million)
  - **Package 2:** Reconstruction of part of the ‘Vostok’ transmission pipeline (estimated USD 9 million)

# Procurement package 1: consumer substations

- ❑ Open system both for Space Heating and domestic hot water (DHW)
- ❑ Package includes
  - **222 new substations** to be supplied and installed and upgrading of **1,825 existing substations**;
  - **4,000** heat and DHW meters
- ❑ Anticipated budget is **USD 21 million**
- ❑ Procurement schedule (preliminary)
  - Invitation For Bids out - October 2018
  - Bidding deadline - December 2018
  - Contract signing - January 2019

# Procurement package 2: renovation of Vostok transmission line

- ❑ Assignment – renovation of one of five key transmission lines
  - Length: **3.0 km**
  - Preinsulated pipes installed in concrete channels
- ❑ 3 procurement packages envisage:
  - 1 package for each section
  - Supply & work type contract
- ❑ Preliminary procurement schedule
  - Invitation For Bids – November 2018
  - Bids received and assessed - December 2018
  - Contract signature – January 2019







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# District Heating Efficiency and Reliability Improvement in Bishkek

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# ANNEX

# Scope of technical and economic assessment

## Four key investment areas analyzed:

1. Building level substations with heat and HW meters
2. Apartment level heat and HW metering
3. T&D network improvement
4. Variable speed pumps and SCADA

# Consumer substations including building level heat and HW metering

## Scope of investment

- Repairing **1,825 existing substations**
- Installing **222 new substations** (with mixing control) mainly to replace remaining hydroelevators
- Installing **4,000 new heat and HW meters**

## Rationale for investment

Investment costs	Energy, water and O&M cost savings	Energy and water savings	IRR
Up to USD 25.2 million	USD 3.2 million/a (77% heat energy cost savings)	<ul style="list-style-type: none"><li>• Heat: 174,462 Gcal/a (-9%)</li><li>• Water: 1,934,452 ton/a (-13%)</li><li>• Electricity: 3,073 MWh/a (-5%)</li></ul>	12.4%

## Prioritization and phasing

## Preparatory activities

# Replacement of critical pipes in the T&D network

## Scope of investment

- Replacing **80% of pipes** older than 25 years
- Recommended scope of T&D upgrade adjusted in accordance with availability of funds

## Rationale for investment

Investment costs	Energy, water and O&M cost savings	Energy and water savings	IRR
Up to USD 141.2 million (open system)	Up to USD 13.0 mill./a (62% O&M savings)	<ul style="list-style-type: none"><li>• Heat: 245,574 Gcal/a(-13%)</li><li>• Water: 4,942,270 ton/a (-26%)</li><li>• Electricity: 4,325 MWh/a (-7%)</li></ul>	7.3%

## Prioritization and phasing

## Preparatory activities

# VSD pumps and SCADA

## Scope of investment

- Replacement of the **36 biggest pumps** at 13 booster pumping stations with new energy efficient pumps and VSD as well as the installation of a new SCADA system

## Rationale for investment

Investment costs	Energy and O&M cost savings	Energy savings	IRR
USD 5.53 million	USD 0.95 million/a	6,041 MWh electricity (-33%)	18.6%

## Prioritization and phasing

## Preparatory activities