

BASELINE

The boiler house is located in the south of the city of Vinnytsia, in the area of the Regional Hospital and the Military Hospital.



Basic equipment

Equipment name	Type	Q-ty, pcs.	Capacity
Gas boiler	NIISTU-5	1	0.5 Gcal/h
Gas boiler	KBN-G-2, 5	1	1.72 Gcal/h
Solid fuel boiler	BRS/ARS 100-1200 comfort	2	1.03 Gcal/h
Solid fuel boiler (vapour)	E-1.0-0.9G-3	2	0.65 Gcal/h
Circulation pump	D-200	2	200 m³/h
Circulation pump	K45/30	1	45 m³/h
Circulation pump	K-100/65-200A	2	94 m³/h
Feed pump	K 20/30	4	20 m³/h
Feeding pump	K 8/18 Speroni VS 2-15	1	3.5 m³/h

Source: Communal Enterprise "Vinnytsiaoblteploenergo".



Figure. Pirogova, 109

Existing condition

- **Boilers** – satisfactory condition. 2 gas boilers installed – commissioning in 2007 Average coefficient of efficiency of gas boilers – 86-88%. 2 solid fuel boilers installed Actual coefficient of efficiency – 76-78%.
- **Pumping equipment** – unsatisfactory condition. Most pumping equipment needs to be replaced. No frequency converters or emergency backup.
- **Chemical water treatment** – unsatisfactory condition. The existing chemical water treatment system with sulfo carbon does not ensure the required quality of feed water.
- **Building** – condition –ongoing repair required.
- **Networks** – satisfactory condition. Almost 100% of the networks were replaced as part of ongoing and major repairs.
- **Territory** – the boiler house is located in the hospital territory. Not fenced.

Heating Network

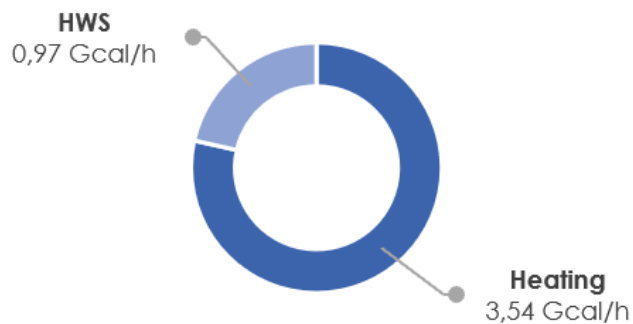
Source: Communal Enterprise “Vinnytsiaoblteploenergo”.

Note: The total length of the heat network is **1, 198 m**.

Connected heat load

The total connected thermal load of the boiler house is **4.51 Gcal/h**, of which 3.54 Gcal/h is used for building heating, and 0.97 Gcal/h is for hot water supply (HWS).

In total, 16 consumers are connected to the heat supply system of the **boiler house**.



Source: Communal Enterprise “Vinnytsiaoblteploenergo”

Features

- Solar collectors on the roof (≈ 60 kW) for reheating the return coolant
- Heat metering available
- Vapour boilers: 2× E-1/9 (1 t of vapour/h, 0.65 Gcal/h each) for hospitals and technological needs during the non-heating period
- Chemical water treatment system with sulphur coal filters
- Pumping units without frequency converters, partially without emergency backup
- Solid fuel is stored in the boiler house; fuel storage facility is required.
- Building of the boiler house – visually unsatisfactory condition

RATIONALE



Replacement of worn-out solid fuel generation equipment with more modern installations with higher efficiency and integration of heat pump for hot water supply in order to increase the share of renewable energy.



Improving the reliability and flexibility of the heat supply system through diversification of energy sources and maintaining reserve capacities.



Reducing operating costs and CO₂ emissions by improving energy efficiency and optimizing equipment operation.



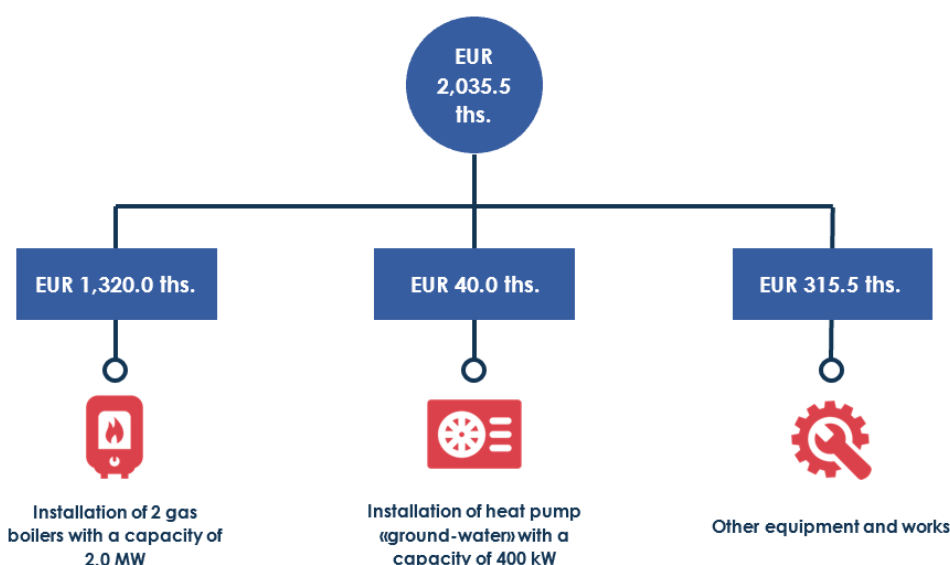
Improving safety operation by installing modern protection and control systems.

INVESTMENT COMPONENT DETAILS

No.	Component	Clarification
1	Installation of 2 solid fuel boilers, each with a capacity of 2.0 MW with automatic fuel feed. Installation of solid fuel storage facility based on 3 days of work and weighing.	The new solid fuel boilers replace the existing ARS boilers, which will be dismantled, ensuring improved efficiency and reliability. Gas boilers remain in reserve to ensure continuity of heat supply. In combination with a heat pump, the new configuration covers the entire heat load of the boiler house. The equipped warehouse provides a three-day supply of fuel and allows for consumption control.
2	Buffer tanks for water storage - V 20 cubic meters.	Additional volume of hot water allows to smooth out the peak loads and increase the stable operation of the system.
3	Heat pump «ground-water» for hot water supply - 400 kW + battery tanks	Reduced fossil fuel consumption in summer period and increased share of renewable energy.
4	Replacement of pumping equipment (MN, PN 2 units + FC, HWS pumps)	Improved energy efficiency and reliability due to the installation of modern frequency-controlled pumps and emergency backup.
5	Replacement of chemical water treatment (capacity 0.5 m/h)	Ensuring stable quality of treated water to reduce deposits and extend the service life of equipment.
6	Other additional measures for the boiler house: 1. Installation of fire alarm system. 2. Installation of fire extinguishing system. 3. Installation of gas detection alarm system. 4. Installation of heating and ventilation systems. 5. Installation of lightning protection system. 6. Installation of grounding system.	A set of measures to bring the boiler house into compliance with the modern safety requirements, improving operating conditions, and protecting equipment.
7	Roof repair and refurbishment of the external walls of the building.	Restoration of structural elements to extend the service life of the building and improvement of the overall technical condition of the facility.

COST

The estimated cost of implementation of the component is **EUR 2,035.5 ths.**

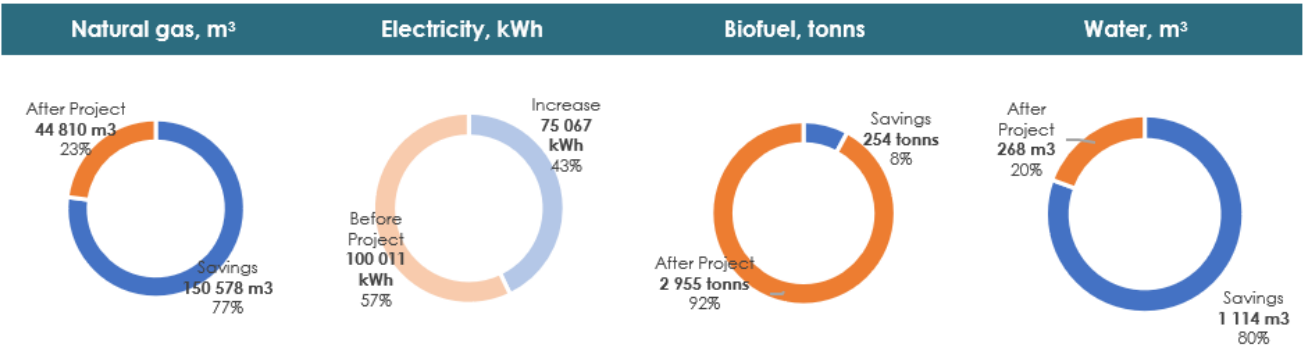


Source: Consultant's calculations.

Note: The item «other equipment and works», replacement of pumping and water treatment equipment, other additional measures for the boiler house and partial repair of roof and walls of the boiler house building, etc.

SAVING

The result of the implementation of the component is a reduction in natural gas and electricity consumption through the installation of energy-efficient equipment.



Note: The increase in electricity consumption is due to the installation of a ground-to-water heat pump to operate during the inter-heating period for DHW needs.