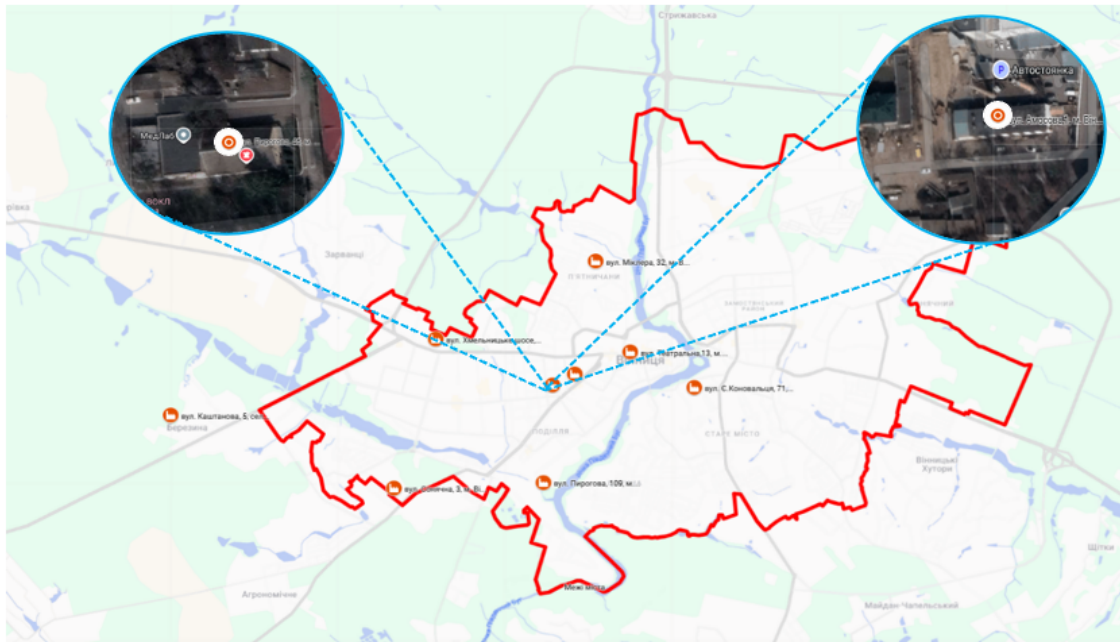


3.1 Component No. 1. Boiler house area Amosova, 1, Vinnytsia

BASELINE

Location

The boiler house is located in the south of the city of Vinnytsia, in the area of the Vinnytsia National Medical University and the Pirohov hospital.



Basic equipment

Equipment name	Type	Q-ty, pcs.	Capacity
Boiler house 1 Amosova St.			
Gas boiler	KVG-6.5/150 (1985)	3	6.5 Gcal/h
Solid fuel boiler	T-500 (2024)	2	0.43 Gcal/h
Circulation pump	D 315/70	2	315 m³/h
Feed pump	K 45/30	1	45 m³/h
Booster pump	K 45/30	1	45 m³/h
Boiler house 46 Pirohova St.			
Gas boiler	VK-21 (2007)	2	1.72 Gcal/h
Circulation pump	WILO-W071080-2-F154LI	2	
Circulation pump	ELVEM-GT180S	2	

Source:KP "Vinnytsiaoblteploenergo".



Figure. Amosova Street, 1



Figure. Pirogova Street, 46

Existing condition

- **Boilers** – satisfactory condition. Average coefficient of efficiency of boilers - 86-88%. Fuel type natural gas;
- **Pumping equipment** – satisfactory condition, however, the equipment needs to be replaced with more energy-efficient equipment with parameters corresponding to the actual load. Frequency converters are not available.
- **Chemical water treatment** – to be replaced. Na-cationite filters installed do not ensure the required quality of feed water.

- **Building** – partial repair required. There are cracks on the walls, missing plaster, and minor roof leaks.
- **Territory** – fenced, video surveillance arranged. The territory includes a solid fuel storage facility and a solid fuel modular boiler house.

Central heating stations

Hot water supply to consumers is arranged through the central heating stations (CHS). The heat carrier is supplied from the boiler house located at the address 1 Amosova St. (during heating period) and from the boiler house at the address 46 Pirohova St. - during inter-heating period. In total, 5 central heating stations are connected to the boiler house at the addresses:

- 1A Amosova St.;
- 29 Shevchenka St.;
- 50A Halytskoho St.;
- 27 Bolharska St.;
- 6 Pirohova St.
-

Heating Network

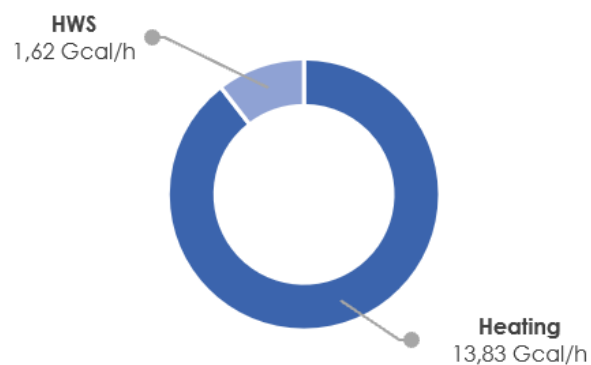
Source: Communal Enterprise "Vinnytsiaoblteploenergo".

Note: The total length of the heat network is **7, 937 m**.

Connected heat load

The total connected thermal load of the boiler house is **15.45 Gcal/h**, of which 13.83 Gcal/h is used for building heating, and 1.62 Gcal/h is for hot water supply (HWS).

In total, 81 consumers are connected to the heat supply system of the **boiler house**.



Source: Communal Enterprise "Vinnytsiaoblteploenergo"

Features

- Common heat network for the boiler house at 1 Amosova St. and 46 Pirohova St.
- Hot water supply is arranged through 5 central heating stations.
- Heat, water, natural gas, and electricity metering available
- The block-modular solid fuel boiler house was received as a humanitarian aid in 2024. The fuel storage facility is located in the boiler house premises. After reconstruction of the boiler house at 1 Amosova St., the block-modular boiler house will be used at another facility.
- There is a cogeneration unit with an electrical capacity of 260 kW and a thermal capacity of 320 kW
- Backup power supply available
- Boiler house building - partial repair required



Replacement of worn-out gas generation equipment with more modern installations with higher efficiency. Reduction of natural gas consumption by installing modern biomass boiler equipment and decommissioning of the boiler house at 46 Pirogova Street.



Replacing worn-out gas generation equipment with more modern installations with higher efficiency.



Increasing the reliability and quality of heat supply to consumers, reducing heat energy losses during transportation due to 100% replacement of heating Networks.



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



Improving safety operation by installing modern protection and control systems.



Integration of heat pump and solar power plant for hot water supply and electricity generation by increasing the share of renewable energy

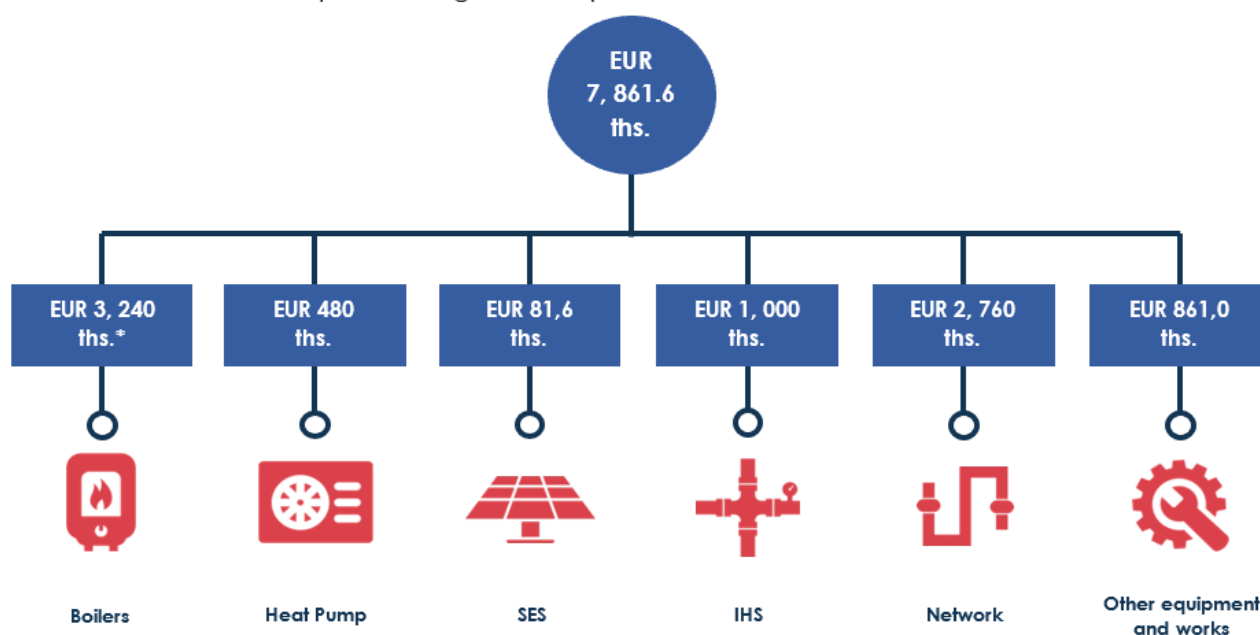
INVESTMENT COMPONENT DETAILS

No.	Component	Clarification
1	Installation of 2 gas boilers with a capacity of 5 MW Installation of solid fuel boiler with a capacity of approximately 4 MW with automatic fuel supply system. Demolition of part of the building. Arrangement for a solid fuel storage facility based on 3 days of work and weighing	The new gas boilers replace the existing KVG-6.5/150 boilers, which will be dismantled, providing reserve and ensuring uninterrupted heat supply. The new solid fuel boiler with automatic fuel supply is expected to be in operation for more than 70% of the time. In combination with the existing CGU, the new configuration covers most of heat load of the boiler house. The equipped warehouse provides a three-day supply of fuel and allows for consumption control.
1	Reconstruction of heat networks - 6 578 l.m.	Improving the reliability and quality of heat supply to consumers, reducing heat energy losses during transportation.
2	Installation of individual heating points on the supply network (independent diagram) - 48 units and hot water supply - 45 units.	Saving fuel and energy resources, reducing leaks and heat loss in indoor systems, improving the quality of heat supply to consumers.
3	Heat pump «air-water» for hot water supply - 500 kW + battery tanks	Reduced fuel consumption in summer period and increased share of renewable energy.
4	Replacement of pumping equipment (MN, PN 2 units + FC)	Improved energy efficiency and reliability due to the installation of modern frequency-controlled pumps and redundancy.
5	Replacement of chemical water treatment (capacity 6.5 m/h)	Ensuring stable quality of treated water to reduce deposits and extend the service life of equipment.

No.	Component	Clarification
6	Solar power plant with a capacity of 100 kW on the boiler house roof	Increased share of renewable energy. Power supply for own production
7	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.
8	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 implementing this component is **EUR 7, 861.6 ths.**



*3240 thousand euros - 600 thousand euros is the cost of gas boilers, 2640 thousand euros is the cost of a solid fuel boiler

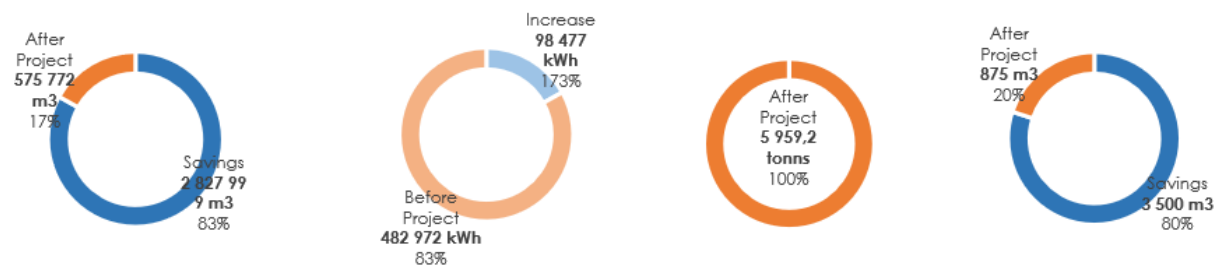
Source: Consultant's calculations.

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 this component is reduced consumption of natural gas, electricity, and water through the transition to solid fuel boilers, installation of energy-efficient equipment, replacement of networks, and installation of individual heating points

Natural gas, m ³	Electricity, kW-h	Biofuel, tonnes	Water, m ³
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Source: Consultant's calculations.

Note: Biofuel consumption increases compared to the base year of 2024 due to the reduced consumption of natural gas and installation of 4 MW solid fuel boiler in the boiler house.