

**Site visit assessment report**

**CC Tetovo - Surgery**

**Location: Tetovo**

**Date of visit: 19.10.2023**

**Prepared by: Petar Grncarovski, Darko Todorovic**

The "Surgery" (Hirurgija) is one of the buildings within CC Tetovo. The Surgery building is supplied with thermal energy from the internal boiler room on liquid fuel - oil, which is located in the basement of the building.

Within boiler room two boilers have been installed. The boilers are same, both produced by "Boris Kidric", made in Slovenia with a nominal capacity of around 1000kW. The boilers are outdated and generally in poor condition. Within the boiler room, in terms of HVAC equipment, there are two headers for supply and return water, connections for the pipe's branches, pipe lines with circulation pumps. Valves, circulation pumps and insulation in the boiler room are in bad condition and should be replaced. In the separate room heat substation has been installed with additional headers, pipe branches, circulation pumps and valves. All equipment in that substation too, are in bad condition and require replacement. Domestic hot water boilers (3 x 2000 lit.) are placed in substation, connected to hot water network.



The boiler room supplies only the subject object of the Clinical center. In the building, the heating system is operational 24h/365days per year. Approximate annual consumption amounts to 123t of oil.

The boiler room is adequately set up and has sufficient surface area for the intended purpose.

The building has a classic two-pipe hot water heating system with lower distribution network. Cast iron radiators with radiator valves and radiator screws have been installed in the rooms.

The windows at the hospital are old, made of steel with massive infiltration issues.

The district heat network is far away from the building, so that option is not realistic, as is the supply of the gas network that would deliver natural gas.

From the initially planned measures, it is proposed to replace radiator valves with new ones that have the possibility of installing thermostatic heads in an anti-vandal version, new radiator screws, replacement

of insulation on pipelines within the boiler room, replacement of circulation pumps with new frequency-regulated ones (variable flow), as well as the installation of a connection for future installation of gas boilers or district heating network. It is also recommended actions on automatic controls in connection with the regulation of the temperature of the supply heating water in accordance with the outside air temperature.

An alternative to the natural gas connection is the installation of gas generators for external installation on the facade of the building with an underground gas tank. According to the situation assessed during site visit installation of the gas equipment is possible. Exact location of façade boilers, gas tank and other gas equipment should be checked and confirmed.

OBJECT	25-TE cor	KB-HIRURGIJA		
Location:		Tetovo	Date visited:	19/10/2023
Activity:	HTH	Hospital	By:	Petar Grncharovski
No.of objects within:		1		Darko Todorovic
Area, TOTAL [m2]:		12677	Property list:	
Dist.from gas network:		n/a	Estim.cost:	n/a
Dist.from district heating:		n/a	Estim.cost:	n/a
Estim.heat demand [kW]:		2028		
Contact:		d-r Ilir Demiri, director	070/321-568;	
		Nagib, tech.department	075/383-100;	
<b>CURRENT CONDITION</b>				
<b>General:</b>	Old facade w/o insulation; old aluminum windows (1988 apx.)			
<b>Heating system:</b>				
- Boiler room position:	underground			
- Neighboring facade:	available, to be checked if size is appropriate (for possible installation of outdoor gas boilers)			
- Boiler:	<i>year</i>	<i>manufacturer</i>	<i>capacity [kW]</i>	<i>burner</i>
unit 1	1986	Boris Kidric Maribor	1050	n/a
unit 2	1986	Boris Kidric Maribor	1050	n/a
unit 3				
- Fuel/Consumption [l/y]:	light oil (EL)		/ 123000	
- Regulation:	manual			
- Heating units/ number:	cast iron radiators		/ 700, apx	
- Heating units valves:	standard - manual		(w/o temperature regulation)	
<b>Altern.energy source:</b>	CNG		/ sufficient space for CNG equipment in the yard	
<b>Remarks:</b>	object is located next to the public street where approach for fuel supply, oxygen supply is enabled general urban-architectural project is planned in upcoming year, central CNG station to be incorporated			
<b>RECOMMENDATIONS</b>				
<b>General:</b>	Energy efficiency measures on facade, roof and windows			
<b>Heating system:</b>				
<b>Option 1</b>				
- Boiler room measures				
- Boiler room position:	remains same			
- Boiler room installation:	complete refurbishment of installation with implementation of frequent regulated pumps, new valves and temperature/pressure measuring devices, balancing and control valves, pipes insulation			
- Regulation:	automatic depending on external/internal temperatures			
- Preparational works for new boilers installation:	connections for new boilers to be implemented in the boiler room design; existing light oil (EL) boilers remain as main heating source until new boilers are installed			
<b>Option 2</b>				
- Secondary heating network measures				
- Heating units:	dismantle from pipe network, adequately clean and install back existing manual radiator valves to be replaced with thermostatic valves			
- Raiser:	valves replacement, balancing and drainage valves to be implemented			
- Pipe network:	spaces where heating not necessary, pipes to be adequately insulated			
<b>Option 3</b>				
- New boiler installation measures				
- New boiler:	install.of outdoor gas boilers on the neighbor.facade wall, if not possible on a convenient place nearby			
- Back-up heating:	existing light oil (EL) boilers remain as spare			
<b>Remarks:</b>	due to position of existing boiler room which is underground, outdoor gas boilers are recommended; therefore existing light oil boilers are to be utilized in exceptional cases ex.gas supply interruption, failure on the gas boilers etc.			