

<b><u>Site visit assessment report</u></b>
<b><u>Policlinic Cento</u></b>
<b><u>Location: Skopje</u></b>
<b><u>Date of visit: 04.10.2023</u></b>
<b><u>Prepared by: Petar Grncarovski, Darko Todorovic</u></b>

The building of the polyclinic Cento is supplied with thermal energy from the boiler room on liquid fuel - oil, which is located in the basement of the building.

The boilers are identical, both are of Greek production with a nominal capacity of 232kW each. The boilers are outdated and generally in poor condition. Within the boiler room, 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.



The boiler room supplies only the subject object of the polyclinic. In the hospital, the heating stops at 5 pm, there are no bed patients.

Approximate annual consumption is 30t of oil.

The 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. Aluminium radiators with radiator valves and radiator screws have been installed in the rooms of the hospital.

The windows at the hospital are aluminum without rubber gaskets, they are in bad condition, there is significant infiltration. The facility has no thermal insulation.

The heat pipe 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. The building is located on a plot of land where there is no space to accommodate a new LPG boiler house, there is a possibility to install gas generators for external installation on the facade of the building.

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 LPG or natural gas boilers. 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 polyclinic with a underground LPG tank. According to the situation assessed during site visit installation of the LPG equipment is possible.

OBJECT	2-SK cor	POLIKLINIKA CENTO			
Location:		Skopje	Date visited:	04/10/2023	
Activity:	HTH	Polyclinic	By:	Petar Grncharovski	
No. of objects within:	1			Darko Todorovic	
Area, TOTAL [m2]:	2200		Property list:	no. 757 (4689)	
Dist. from gas network:	2000m		Estim. cost:	170000	
Dist. from district heating:	1200m		Estim. cost:	108000	
Estim. heat demand [kW]:	352				
Contact:		Zoran Lekic, technical supervisor	075/358-847;		
<b>CURRENT CONDITION</b>					
<b>General:</b>	Old facade w/o insulation; aluminum windows				
<b>Heating system:</b>					
- Boiler room position:	underground				
- Neighbouring facade:	available		(for possible installation of outdoor gas boilers)		
- Boiler:	<i>year</i>	<i>manufacturer</i>	<i>capacity [kW]</i>	<i>burner</i>	
unit 1	2003	Radialand-AR-200, Greece	232	Ventilator-Zagreb	
unit 2	2003	Radialand-AR-200, Greece	232	Ventilator-Zagreb	
unit 3					
- Fuel/Consumption [l/y]:	light oil (EL)		/ 30000		
- Regulation:	manual				
- Heating units/ number:	aluminum radiators		/ 150, apx		
- Heating units valves:	standard - manual		(w/o temperature regulation)		
<b>Altern. energy source:</b>	CNG / space for CNG supply station in the part of yard, need for reorganizing outdoor (to be checked)				
<b>Remarks:</b>					
<b>RECOMMENDATIONS</b>					
<b>General:</b>	Energy efficiency measures on the facade, roof and windows (not part of this project)				
<b>Heating system:</b>					
<b>Option 1</b>					
<b>- Boiler room measures</b>					
- 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>					
<b>- Secondary heating network measures</b>					
- 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>					
<b>- New boiler installation measures</b>					
- New boiler:	installation of outdoor gas boilers on the neighboring facade wall				
- 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 that are to be installed on the neighboring facade wall are recommended; therefore existing light oil boilers are to be utilized in exceptional cases ex. gas supply interruption, failure on the gas boilers etc.				