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| <b><u>Site visit assessment report</u></b>                                     |
| <b><u>CC Tetovo – The ambulance service (incl. Dentist clinic and ATD)</u></b> |
| <b><u>Location: Tetovo</u></b>   |
| <b><u>Date of visit: 19.10.2023</u></b>  |
| <b><u>Prepared by: Petar Grncarovski, Darko Todorovic</u></b>                  |

The “The ambulance service” is one of the buildings within CC Tetovo. That 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 one boiler has been installed. The boiler is Thermostahl EN-330, Greece, with a nominal capacity of around 380kW. The boiler is outdated and generally in poor condition.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 pipe’s insulation in the boiler room are in bad condition and should be replaced.



The boiler room supplies only the subject object of the Clinical center.

The boiler room is adequately set up and has sufficient surface area for the intended purpose. Approximate annual consumption amounts to 15t of oil.

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

The windows at the hospital are partly replaced with PVC, old one are made of wood 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 LPG tank. According to the situation assessed during site visit installation of the LPG equipment is possible. Exact location of façade boilers, LPG tank and other LPG equipment should be checked and confirmed.

|   |                  |   |   |                          |
|---|------------------|---|---|--------------------------|
| <b>OBJECT</b>                                       | <b>29-TE cor</b> | <b>AMBULANTA</b>  |   |                          |
| Location:   |                  | Tetovo  | Date visited:   | 19/10/2023               |
| Activity:   | HTH              | Ambulance (daily shift)   | By:   | Petar Grncharovski       |
| No.of objects within:                               | 2                |   |   | Darko Todorovic          |
| Area, TOTAL [m2]:                                   | 1100             |   | 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]:                             | 176              |   |   |                          |
| Contact:  |                  | d-r Ilir Demiri, director   | 070/321-568;  |                          |
|   |                  | Nagib, tech.department  | 075/383-100;  |                          |
| <b>CURRENT CONDITION</b>                            |                  |   |   |                          |
| <b>General:</b>                                     |                  | Non-insulated facade; wooden/plastic windows  |   |                          |
| <b>Heating system:</b>                              |                  |   |   |                          |
| - Boiler room position:                             |                  | ground level  |   |                          |
| - Neighboring facade:                               |                  | available, to be checked if size is appropriate   | (for possible installation of outdoor gas boilers)          |                          |
| - Boiler:   | year             | manufacturer  | capacity [kW]   | burner                   |
| unit 1  | 2005             | Thermostahl EN-330, Greece  | 383   | Ecoflam-Italy, 12-25kg/h |
| unit 2  |                  |   |   |                          |
| unit 3  |                  |   |   |                          |
| - Fuel/Consumption [l/y]:                           |                  | light oil (EL)  | /   | 15000                    |
| - Regulation:                                       |                  | manual  |   |                          |
| - Heating units/ number:                            |                  | steel radiators   | /   | 80, apx                  |
| - Heating units valves:                             |                  | standard - manual   | (w/o temperature regulation)                                |                          |
| - Altern.energy source:                             |                  | CNG   | / to be checked for sufficient space for CNG station nearby |                          |
| <b>Remarks:</b>                                     |                  | object belongs to Zdravstven dom, it is not part of Clinic Hospital, independent solution for CNG supply necessary or gas meter for consumption measuring   |   |                          |
| <b>RECOMMENDATIONS</b>                              |                  |   |   |                          |
| <b>General:</b>                                     |                  | Energy efficiency measures on facade, roof and windows  |   |                          |
| <b>Heating system:</b>                              |                  |   |   |                          |
| <b>Option 1</b>                                     |                  |   |   |                          |
| <b>- Boiler room measures</b>                       |                  |   |   |                          |
| - Boiler room position:                             |                  | remains same, to be checked if it is appropriate for its purpose  |   |                          |
| - 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) boiler 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:                                       |                  | 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 boiler is to be utilized in exceptional cases ex.gas supply interruption, failure on the gas boilers etc. |   |                          |