



## Improvement of the heating system of “Multi-profile Hospital for Active treatment-Svishtov” Ltd., Municipality of Svishtov Sofia Energy Center, Bulgaria

### Summary

This case study highlights the package of technical measures, leading to energy efficiency investments, which were undertaken at the end user level in a public building in the Municipality of Svishtov. The main goal of the project is implementation of technical measures for reduction of the cost in “Multi-profile Hospital for Active Treatment - Svishtov” Ltd. for heating and electricity and for hot water supply of the hospital premises in „MHAT – Svishtov“ Ltd., through substitution of the liquid fuel (mazut) for wood briquettes. The scheme for financing the elaboration of the project includes borrowed capital (28.74%) and own participation of the MHAT (71.26%). As a result to the complete implementation of such a project, the costs for heating of „MHAT – Svishtov“ Ltd. are expected to be reduced by 33.8% compared to the present ones.

#### End-user area

- New buildings
- Refurbishment of buildings
- Transport and mobility
- Financial instruments
- Industry
- Legal initiatives (regulations, directives, etc)
- Planning issues
- Sustainable communities
- User behaviour
- Education
- Other

#### Target Audience

- Citizens
- Households
- Property owners
- Schools and universities
- Decision makers
- Local and regional authorities
- Transport companies
- Utilities
- ESCOs
- Architects and engineers
- Financial institutions
- Other

#### Technical

- Energy efficiency
- Heating
- Cooling
- Appliances
- Lighting
- CHP
- District Heating
- Solar energy
- Biomass
- Wind
- Geothermal
- Hydro power
- Other

### Context

“Multi-profile Hospital for Active Treatment - Svishtov” Ltd. is a legal entity owned by the Municipality of Svishtov, financed by the budget of the Municipality of Svishtov and the National Health Insurance Fund. The hospital has a capacity of 209 beds, 12 departments and 297 people personnel, and is the only health centre for rendering of specialized medical help to the population of the Municipalities of Svishtov, Belene, Bjala and Levski, which predetermines its great social importance. The building of the hospital has a 11-storey frame and a low-rise part, in which are situated a polyclinic, specialized departments, administrative department and functional premises.



The Hospital

The required energy for heating and supply of hot water in the “Multi-profile Hospital for Active Treatment - Svishtov” Ltd. had been provided by liquid fuel (mazut) and electricity. Taking into consideration the high and constantly rising prices of these energy carriers, the “Multi-profile Hospital for Active Treatment - Svishtov” Ltd. needed a more cost effective and energy efficient solution. The management of the hospital decided to implement an energy efficiency project for construction of a new wood briquette-fired water heating boiler KVDB 2MW and for restructuring of a steam boiler installation and technological pipes.



## Objectives

The main objective of the project is reduction of the energy costs, through improvement of the efficiency of the boiler station and the network for transmission and distribution of the heat energy in „MHAT – Svishtov“ Ltd.

## Process

The following technical measures have been implemented:

- **Restructuring of the boiler plant and installation of a water-heating boiler for operation with wood briquettes:** changing the heating of „MHAT-Svishtov“ Ltd. to a water-heating option with mounting of a specially designed boiler for incineration of waste wood products from „Svilozha“ Jsc., Svishtov. The project foresees the installation of a new water-heating boiler of type KVDB with heat capacity of 2 MW, with temperature of the network hot water up to 105 °C for burning of solid fuel - wood briquettes, instead of mazut. The boiler was mounted at the place of the two existing boilers PKM-4M. The one and only fuel for the boiler with grate burning are briquettes from wood particulates with calorificity of above 4 100 kcal/kg provided by „Svilozha“ Jsc, situated 6 km away from „MHAT – Svishtov“ Ltd., disposes of an operating installation for production of wood briquettes with capacity 3 000 tons/year. The water-heating boiler is a vertical one, construction with a cooling furnace camera, covered with membrane screening panels. The boilers burn at nominal load 525 kg/h of wood briquettes. The expected efficiency coefficient of the boiler is around 80%. The delivered wood briquettes are stored in a closed storehouse, near the boiler premises.
- **Restructuring of the heat transmission network:** installation of the necessary junctions of the boiler – network pipes from the boiler to the heat exchanging apparatus in the substation, air-pipes and gas-pipes, naphtha-pipes to the boiler, drainages and air-drains. The produced hot water in the boiler with temperature 105 °C and pressure 0.6 MPa is transferred with the help of two circulation pumps to the substation of the hospital. 200 meters of pipes for network water are installed, with heat insulation from the boiler premises to the substation.

The capital financial indicators demonstrate the feasibility of the project and its attractiveness for realization. The cumulative cash flow during the credit period is enough for the flawless servicing of the obligations till the end of the credit period.

## Financial resources and partners

The total project costs are about 160 thousand Euro. The suggested scheme for financing the elaboration of the project includes borrowed capital to the amount of about 45 thousand Euro, the rest will be provided as own participation of the MHAT. The expected pay-back period of the investment is 3.31 years.

The partnership is formed among EnCon Services (one of participating in Biomass Partnership stated by a Letter of intent) – company providing assistance in feasibility studies and in getting bank financing and the representatives of buildings owners. The role of Sofia Energy Centre was to assist in forming the partnership and bringing together equipment supplier, consultant, financier and building owners.

## Results

As a result to the complete implementation of such a project, the costs for heating of „MHAT – Svishtov“ Ltd. are expected to be reduced by 33.8% compared to the present ones. The total installed capacity of biomass fueled boilers is 2 MW.

The detailed preliminary analyses of the project and the percent calculation of the economies, and the calculated annual percentage of economies from realization of the project is 310 tons of mazut per year. The consumed liquid fuel - 310 tons of mazut is substituted for annual consumption of 677 tons of wood briquettes and 51,648 kWh electrical energy, which counts for 33.8% reduction in the energy costs for heating.



The Wood briquette boiler



As a result from the substitution of the combusted in the boiler installations mazut for wood briquettes, the emissions of CO<sub>2</sub> would be reduced by 360 tons for the year 2003. For the period between 2003 and 2018 the reduction of the emissions of CO<sub>2</sub>, as a result of the project will be 11 342 tons. As a result from the substitution of the fuel base and the emissions of sulphur and nitrogen oxides will be reduced.

### Lessons learned and repeatability

A key barrier to introduction of energy efficiency in public and/or residential buildings is not the technology itself, but the limited sources of finance and the policy framework which limits the state subsidies which have to catalyze investments for energy efficiency improvements. The state with its regulative function shall encourage investments and facilitate the process of technology and finance transfer.

The project reveals that the partnership concept when all interested parties can successfully overcome the barriers and end-up with installation of biomass fueled facilities. The concept is able to be replicated both within Bulgaria and elsewhere in Europe. A very important moment is to involve organizations providing technical assistance to the owners in preparation of feasibility studies and also access to credit lines or other financing sources available at place.

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