**A car park like no other**

The Voivodship Specialist Hospital in Olsztyn, as part of the activities undertaken in the Procure4Health project (https://procure4health.eu), plans to change the function of the former boiler house building and convert it into a multi-storey car park with an environmental centre.

The WSS Olsztyn has been struggling for years with the issue of heavy traffic and too few parking spaces on its site (417 spaces). The issue is an offshoot of changing lifestyles, the use of own transport by staff, patients and their families, as well as suppliers and other stakeholders.

We would therefore like to achieve a solution that, on the one hand, makes the most efficient use of the former boiler house building (with the possibility of expansion) so that it can safely accommodate as many cars as possible and, on the other hand, is a centre for environmental protection.

Our vision is that the **resulting structure should not only be zero-carbon, but also positive energy**. We hope to **use renewable energy as much as possible** to allow year-round operation, by introducing technologies that are as energy efficient as possible. We also expect to **use rainwater and waste water** from the Hospital. We see the solution used in this project as a pilot and in the future we want to be able to use as much rainwater and waste water as possible.

The Hospital is already making efforts to take care of the environment, including: **Water** - we clean, maintain, disinfect and replace aerators (water aerators) in basin showers and shower heads on an ongoing basis, and regularly analyse water quality. **Waste** - we manage waste in a rational and environmentally friendly manner by selective collection and transfer for recycling or disposal, with particular emphasis on medical waste.

**The project under review is intended to be the next step in implementing our vision of achieving the greenest possible hospital.**

**In accordance with our policy, we would like the project in question to offer at least the following:**

* was cost effective (parking space for Hospital employees),
* improved traffic safety on the Hospital campus,
* used waste and rainwater to:
  + feed into the building's two-station car wash facility:
    - commercial intended for car park users,
    - non-commercial intended for service vehicles and hospital waste transport containers,
  + supplying water to neighbouring buildings (or parts thereof),
  + irrigation of the hospital grounds, including greenery,
* use of RES installations to secure the energy needs of the building and possibly other buildings.

The existing boiler house building has 5 levels and has a partial basement. It has a reinforced concrete frame construction (frame partly infilled with 38 cm thick brick). Prefabricated reinforced concrete slab roof covered with felt with 5 cm thick chip-cement board insulation. Reinforced concrete slab-and-rib ceilings. Above-ground external walls of 38 cm thick hollow brick. Steel and partially wooden glazed windows (missing shuttering protected by sheet metal). The last inventory of the building was carried out in 2005.

The facility is expected to locate:

1. **A multi-storey car park including:**

* At least 100-120 parking spaces,
* A minimum of two electric car charging stations,
* Station(s) for disinfecting and washing of official cars, hospital waste transport containers and washing of commercial cars,
* Facilities for parking attendants and disinfectants,
* Equipment with which cars will be parked (in an automated manner).

Modules for a self-service multi-storey parking system will be installed at the boiler house. We expect that it will be possible to park min. 4-6 more cars in relation to how many cars are parked in the area corresponding to the area currently occupied by one floor of the boiler house building.

We assume the possibility of using automatic machines and lifts reducing, or even eliminating, human labour in the operation of the car park (including automated car parking).

A drive-through room will be prepared in the building, where a two-station system for washing vehicles and containers supplied with grey water will be installed.

We emphasise that the solution obtained must be safe for users and others and meet their needs.

1. **The Hospital's environmental centre located on the lowest level of the building provides for:**
   1. Installation for the collection of ‘grey’ water and its reuse

* retention tanks,
* filtration station,
* pumping station,
* an aeration system for grey water before it is directed to the washing plant.

Currently, the sources of waste water scheduled for management are [approximate, weekly figures]:

Dialysis station

* 79 520l (halls - contaminated water)
* 13,200l (cleaning columns)
* 19,880l (clean water without contamination)

112,600 litres in total

Central sterilization room

* 39 480l – woda zanieczyszczona z myjek
* 26 600l – czysta woda bez zanieczyszczeń ze sterylizatora
* 39,480l - contaminated water from washers
* 26,600l - clean water without contamination from sterilizer

66,080 litres in total

The above means approximately **178,680 litres of waste water to be used**. It would also be advisable to use rainwater (e.g. collected from the roof of the former boiler house building or other buildings). We assume that the installation will be designed and constructed in such a way as to eliminate unpleasant odours that could be generated in the grey water management process. We expect the water obtained to meet a purity class safe for the use in question (car wash, site watering, other).

* 1. Renewable energy source (RES) installations:
* photovoltaic installation for the power supply of electrical equipment (filter station, car wash, vehicle charging stations),
* installation of heat pumps with a total capacity of no less than 210 kW integrated with the district heating hub).

Optional (additionally scored):

* category 3 waste management facility (1,300 kg per week) and biodegradable waste (300 kg per week). Kitchen waste - methane digestion, gas purification station, gas engine-based generator set)
* waste paper management facility (we generate approximately 2.5 Mg/month)

We expect that the use of renewable energy sources will in practice cover the total energy expenditure associated with the operation of the entire building. **The proposed solution is expected to allow for a green, self-financing and at least zero-emission facility.**

**Remarks:**

Hospitals that have infectious wards or treat people with infectious diseases are obliged by law to disinfect their wastewater. They are obliged to do so under the Act on Collective Water Supply and Collective Sewage Disposal of 7 June 2001 (Journal of Laws No. 72, item 747, as amended). The WSS Olsztyn does not have an infectious ward, but serves patients isolated by epidemiological indications. Therefore, we have to use facilities to bring the quality of wastewater up to environmental or other quality standards for recycling and reuse.

It should be mentioned that there is some inconsistency in the regulations in Poland regarding obtaining safe water quality from treated wastewater, installation performance and proper operation. The use of grey sewage as an alternative water source in a building is not subject to legislation. Polish law allows the use of rainwater for, among other things, flushing toilets or watering the garden, but does not mention the use of grey sewage for this purpose.