NZEB PILOT ACTION 2
Budapest, Hungary

eCentral project

Energy Efficient Public Building
in Central Europe

February 2021

Vilmos Endre Swimming Pool, Budapest

BEFORE RENOVATION

GENERAL INFORMATION	
Use of the building	Sport facility
Owner	Budapest 18th District
Built in (year)	1990
Under protection as cultural heritage	No
GPS	47°43'93.9"N 19°21'85.0"E

CLIMATE DESCRIPTION	
HDD 20 (www.degreedays.net)	3219
CDD 26 (www.degreedays.net)	72

ENERGY PERFORMANCE	
Availability of energy performance certificate	Yes
Energy Performance Classification	EE

RENOVATION COSTS	
Costs of renovation (€)	879.310 €
Costs per m² GFA (€/m²)	219,9 €/m²
BUISNESS MODEL - Crowdfunding	
Public Budget	538.848 €
Private Budget	340.462 €
ENERGY PERFORMANCE DATA OF RENOVATION	
Heated gross floor area (GFA)	3.998,5 m²
Heated net floor area (NFA)	1.421,67 m²
Heated gross volume	7.711,7 m³
Heated net volume	2.741,9 m³
S/V	0,519
NZEB TARGET REQUIREMENTS - HUNGARY	
Primary energy (heating, cooling and electricity)	400,4 kWh/m² year
RES (minimum % of primary energy consumption generated from renewables)	52,7 %

1. GENERAL DESCRIPTION

The Vilmos Endre Swimming Pool is located in the 18th District of Budapest. The building was built in the 1990, with technology that met the requirements of that era. Currently the energy performance class achieved by the building is EE. The goal of the renovation is to reach nZEB target following a cost effective way in accordance with the EPBD.

2. ENERGY RENOVATION STRATEGY

The Vilmos Endre Swimming Pool will be renovated as part of the nZEB pilot of eCentral project. In accordance with the preliminary assessment the following renovation is planned to achieve the nZEB target, increasing the energy efficiency performance and indoor quality. Several renovation scenarios were analysed, and it decided to implement these renovation measures:

- insulation of the building envelope: walls and roof;
- replacement of windows with triple glazing technology, and doors;
- replacement of gas boilers with a condensation combi gas boiler;
- heat recovery ventilation;
- use of heat pump;
- use of RES, through solar panels installation.

During the planning phase a feasibility study with cost-benefit analysis and an EPC (Energy Performance Contracting) screening report was made to explore the potential technical solutions to achieve nZEB. The compliance with nZEB requirements has been verified by the Energy Performance Certificates and Audit, modelled on the existing and planned conditions. It has been identified the expected energy savings and the connected investment cost and return for the chosen technical solution.

3. FINANCIAL MODEL

The building will be renovated using carefully defined demands towards the private partner (nZEB compliance, innovation, minimum whole life cycle cost compliance, sustainability standards, public access energy demonstration centre). Green procurement criteria and state of the art of Renewable Energy Sources (RES) technology and Rational Use of Energy (RUE) equipment, including monitoring and verification tools (smart metering) will be requested in order to bring innovation and latest technical achievements to practical use.

There are two models of ESCO financing, Shared Savings (SS) and Guaranteed Savings (GS). The difference is the investments and savings distributions between the client (currently Budapest 18th District) and the ESCO-provider.

The ESCO usually assess the efficiency opportunity, purchase and install necessary equipment to improve performance. Most ESCOs will provide a financing option for these services (for instance off balance sheet financing) and maintenance as well, however it is also true that depending on

ESCO the building owner may be required to seek outside financing. In “classic” ESCO financing model an ESCO charges the building owner a fee to deliver energy savings on the owner’s utility payments. Savings are often guaranteed over a set period of time. The benefits of this financing model are that the owner has a little upfront cost, generally ESCO takes on the performance risk (no saved energy no profit for the ESCO),

ESCOs historically focused on the so-called MUSH market (Municipal, Universities, Schools and Hospitals). This last benefit has a rational reason the above mentioned buildings usually have a single, long-term owner that lowers the service company’s risk. Challenges of this financing model that it is often not good fit for small buildings as the administrative and upfront costs are high so generally we can say it is better if the project is larger so it’s worthwhile.

In this pilot we believe after we work out the solution and create a cost effective best practice, it can be transferred to other public buildings, so our project can be a pioneer.

At the end, this pilot can be considered a best practice for nZEB target achievement, such for the high number of energy renovation strategies developed and analysed, as a pioneer of ESCO financing scheme (not so common in Hungary, where no public building has been renovated by this way yet) and contractual financing scenarios analysed.