

# NZEB PILOT ACTION 3 Velenje, Slovenia

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eCentral project  
Energy Efficient Public Building  
in Central Europe

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May 2018



## University for lifelong learning, Velenje

### BEFORE RENOVATION



GENERAL INFORMATION	
<i>Use of the building</i>	Educational institution
<i>Owner</i>	Municipality of Velenje
<i>Built in (year)</i>	1959
<i>Under protection as cultural heritage</i>	Yes
<i>GPS</i>	Latitude = 46.359605 Longitude = 15.115774

CLIMATE DESCRIPTION	
<i>HDD 20 (<a href="http://www.degreedays.net">www.degreedays.net</a>)</i>	2.779
<i>CDD 26 (<a href="http://www.degreedays.net">www.degreedays.net</a>)</i>	581

ENERGY PERFORMANCE	
<i>Availability of energy performance certificate</i>	Yes (2015-200-193-13909)
<i>Energy Performance Classification</i>	125 kWh/m <sup>2</sup>

RENOVATION COSTS	
<i>Costs of renovation (€)</i>	103.245 € without VAT
<i>Costs per m<sup>2</sup> GFA (€/m<sup>2</sup>)</i>	141,35 €/m <sup>2</sup>
BUSINESS MODEL - Crowdfunding	
<i>Public Budget</i>	58.000 €
<i>Private Budget</i>	45.245,00 € or 44 %
ENERGY PERFORMANCE DATA OF RENOVATION	
<i>Heated gross floor area (GFA)</i>	730,41 m <sup>2</sup>
<i>Heated net floor area (NFA)</i>	730,41 m <sup>2</sup>
<i>Heated gross volume</i>	2.880 m <sup>3</sup>
<i>Heated net volume</i>	2.271 m <sup>3</sup>
<i>S/V</i>	0,516
NZEB TARGET REQUIREMENTS - SLOVENIA	
<i>Primary energy (heating, cooling and electricity)</i>	< 65 kWh/m <sup>2</sup> year
<i>RES (minimum % of primary energy consumption generated from renewables)</i>	> 50 %

## 1. GENERAL DESCRIPTION

The nZEB pilot action within the eCentral project will include energy renovation of the building used by University for lifelong learning (Ljudska univerza Velenje) and testing of the crowdfunding approach for fundraising additional private funds for the whole investment.

The selected building has significant historical, cultural and social value for the local community. It was built in 1959 and beside occasional renovations, shows low energy efficiency and it is far from nZEB status.

## 2. ENERGY RENOVATION STRATEGY

According to the national action plan for nearly-zero energy buildings (AN sNES) for a building (valid for energy renovation of non-residential buildings) to be considered nZEB it must meet a threshold of 65 kWh/m<sup>2</sup>a along with a RER (renewable energy ratio) of 50%. The renovation would have to target an ambitious 65% of energy reduction compared to the current status, while the second condition is met as the building secures more than 50% from a highly efficient district heating system.

To specify the investment, primarily a detailed energy audit would be required.

Based on the prepared feasibility study, recommended measures for reaching nZEB are:

Measure	Energy and cost savings				Investment costs without VAT (€)
	kWh		€		
	TE	EE	TE	EE	
Raising awareness and education and installation of energy monitoring system	5.844	622	235	67	2.750
Thermal insulation of external walls	30.205	0	1.214	0	65.311
Thermal insulation of ceiling	18.443	0	741	0	10.575
Replacing energy inefficient building furniture - door	2.927	0	118	0	3.589
Installing remaining thermostatic valves	5.330	0	214	0	2.115
Replacing inefficient light bulbs	0	7.125	0	772	3.105
Installing photovoltaic system (net metering)	0	12.100	0	1.311	15.800
<b>Total investments costs</b>					<b>103.245</b>

After implementing proposed measures building will be under nZEB threshold, with energy consumption 58,5 kWh/m<sup>2</sup> per year and cost saving of 4.673 EUR per year.

## 3. FINANCIAL MODEL

Part of the calculated investment cost of 58.000 EUR are going to be covered by the project. The rest of 45.245 EUR will be fundraised by using combined crowdfunding approach: a crowdfunding campaign on a platform and traditional campaign collecting contributions as donations and sponsorships.

The ESCO approach will be considered as a reserve option.