

NZEB PILOT ACTION 1

Sveta Nedelja, Croatia

eCentral project

Energy Efficient Public Building
in Central Europe

February 2021

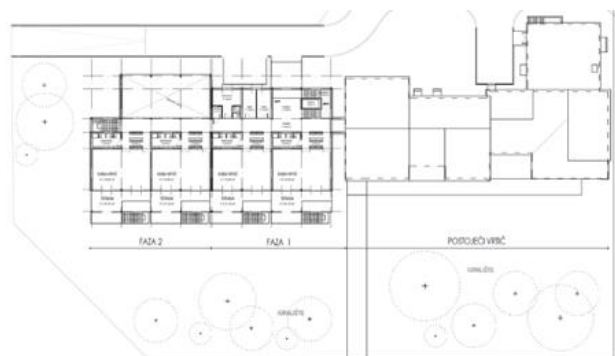


Slavuj kindergarten, City of Sveta Nedelja

BEFORE ENLARGEMENT



AFTER ENLARGEMENT



GENERAL INFORMATION	
<i>Use of the building</i>	Educational
<i>Owner</i>	City of Sveta Nedelja
<i>Built in (year)</i>	1994
<i>Under protection as cultural heritage</i>	No
<i>GPS</i>	Latitude = 45.798983 Longitude = 15.814618

CLIMATE DESCRIPTION	
<i>HDD 20 (www.degreedays.net)</i>	2747 (Zagreb)
<i>CDD 26 (www.degreedays.net)</i>	77 (Zagreb)

ENERGY PERFORMANCE	
<i>Availability of energy performance certificate</i>	No
<i>Energy Performance Classification</i>	-

RENOVATION COSTS	
<i>Costs of renovation (€)</i>	1.600.000 €
<i>Costs per m² GFA (€/m²)</i>	1.206 €/m ²
BUSINESS MODEL - Crowdfunding	
<i>Planned</i>	PPP, with 100 % of Private Budget
<i>Adopted</i>	traditional financing model
ENERGY PERFORMANCE DATA OF RENOVATION	
<i>Heated gross floor area (GFA)</i>	848 m ²
<i>Heated net floor area (NFA)</i>	719 m ²
<i>Heated gross volume</i>	2.917 m ³
<i>Heated net volume</i>	2.217 m ³
<i>S/V</i>	0,50
NZEB TARGET REQUIREMENTS - CROATIA	
<i>Primary energy (heating, cooling and electricity)</i>	37.41 kWh/m ² year or under
<i>RES (minimum % of primary energy consumption generated from renewables)</i>	47.9 %



1. GENERAL DESCRIPTION

Positive demographic changes in the City of Sveta Nedelja are putting constant pressure on providers of pre-school educational services. The basic economic and financial analysis showed that the construction of a new public kindergarten would be a more reasonable solution than providing further subsidies for children who wish to attend public kindergartens rather than private ones. A better control of pre-school education standards and improvement of overall image as a social sensitive city present additional argument for this solution.

Potential technological solutions for heating and cooling of the new nZEB kindergarten building proved to be the biggest dilemma. Therefore, life-cycle costs were studied over a 10, 20 and 30 years in order to properly reflect financial effects of each technological solution. A version which foresees a heat pump system (water-water) combined with a PV system proved to be the most cost-optimal solution. Results of the economic analysis did not show significant differences compared to the financial analysis.

2. ENERGY RENOVATION STRATEGY

New buildings are increasingly constructed to demanding energy performance levels, and the path has already been laid within Energy Performance of Buildings Directive (EPBD) for all new buildings to have nearly zero energy requirements.

Energy Efficiency Directive (EED) complements other requirements within EU legislation concerning the renovation of buildings and requires EU countries to establish long-term strategies for mobilising investment in the renovation of national buildings stock. Croatia has drawn up Long-Term Strategy for Mobilising Investment in the Renovation of the National Building Stock of the Republic of Croatia to show how it is planned to foster investment in the renovation of residential and commercial buildings.

3. FINANCIAL MODEL

A preliminary PPP analysis proved the applicability of Design-Build-Maintain PPP model. However due to the small size of the investment a traditional financing model was more cost-effective for the City. Therefore, the City will invest its own funding for construction of the kindergarten while further PPP testing will be performed for construction of nZEB schools in municipalities of Marija Bistrica and Stupnik.