

RePublic_ZEB

An EU project on the *Refurbishment of the Public Building Stock Towards Nearly Zero Energy Buildings (nZEB)* has recently been completed.



What is RePublic_ZEB?

The core objective of the RePublic_ZEB project was to define costs-benefit optimized "packages of measures" based on efficient and quality guaranteed technologies to refurbish public buildings that are standardized and can easily be adopted by builders and building owners. The aim was to promote to the market a set of robust technical solutions.

The underlying objectives were to assess the public building stock, define reference buildings, engage stakeholders and authorities through communication and dissemination activities and develop a common framework and harmonised methodology for the definition of the nZEB concept. The project mainly focused on the Mediterranean and the South-East European countries in which there are common conditions of climate, energy performance (both cooling and heating are important) and available RES (Renewable Energy Solutions) potential.

What is meant by nZEB?

RePublic_ZEB defined nZEB: *"Transformation of an existing public building to nZEB means to apply renovation technologies that enable the building to reach a target share of RES and deliver energy performance or CO₂ emissions better than the cost-optimal case but still cost effective."*

The nZEB Challenge

The Energy Performance of Buildings Directive (EPBD) in 2010 and the Energy Efficiency Directive in 2012 present challenges both to the building industry and to the Member States. Prominent amongst them is the progress towards new nearly Zero-Energy Buildings (nZEB) as required by Article 9 of the EPBD. The Energy Efficiency Directive sets EU countries the challenge to make energy efficient renovations to at least 3% of buildings owned and occupied by central government.

Further, EU governments should only purchase buildings which are highly energy efficient.

The public sector is seen as a ‘*flag-bearer*’ in terms of adopting and demonstrating nZEB as part of the broader sustainability agenda. However, the implementation of these requirements, especially with respect to nZEBs, depends on the engagement and mutual support of many stakeholders, including local and central government, contractors, designers, building owners and managers, material and technology suppliers, social groups, researchers etc.

“Packages of measures”

To refurbish public buildings, different energy efficiency measures (EEM) can be applied. The interventions are generally related to the insulation of the building envelope (including windows), the adoption of efficient HVAC and DHW systems, Building Management System (BMS), efficient lighting and power generation systems as well as technologies based on renewable energy sources use. The EEMs have national characteristics and their required level of performance can be different in the specific countries. The packages of measures are combinations of different EEMs and the “*optimal packages*” are those that minimise the cost. To achieve these results, RePublic_ZEB has established a database of technical and economic information on the measures available in each country and has produced a tool to find, for every specific building, the “optimal packages”.

RePublic_ZEB engaging with key actors

RePublic_ZEB engaged with different key actors, in three main groups:

- *Policy developers and decision makers* of national or regional authorities responsible for the implementation and the development of the EPBD.
- *Operators of the building sector* such as manufacturers, professionals, associations and organizations, distributors, builders, energy utility companies and ESCOs. All of them have been engaged at the different stages of the project.
- *Public buildings owners* that represent an essential target group as they can influence both the performance of the building by their own behaviour (saving energy, controlling the indoor environment etc.) and the decisions regarding building management and eventual refurbishment.

Policy developers were engaged through “one to one” meetings; professionals, industrial subjects and public building owners were engaged through specific meetings, training sessions, open days and dissemination seminars. The project has also produced a regular newsletter and press releases, distributed through an extended mailing data-base and the project web-site. The final results have been distributed also to a selected list of “VIPs” in each country who have been identified as having the most influence on the implementation of nZEB.

Example of RePublic_ZEB case studies

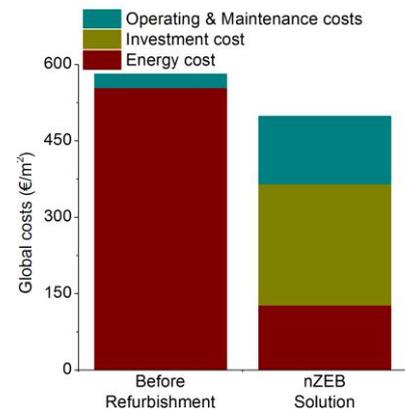
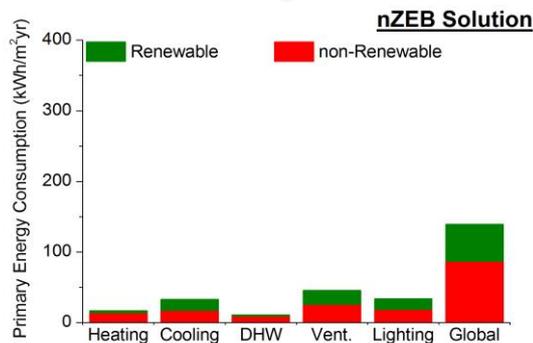
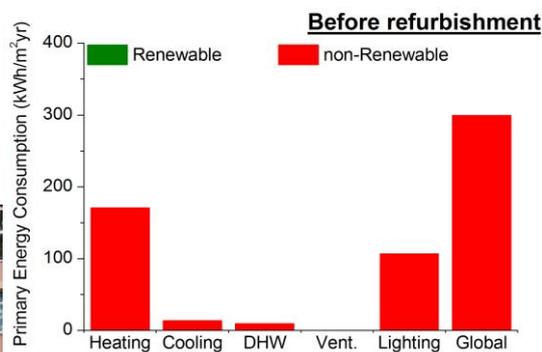
Romanian school



Year of construction: 1970
Conditioned area: 2.026 m²

Optimal package of measures:

- external insulation (15 cm EPS)
- ground insulation (6 cm EPS)
- roof insulation (15 cm EPS)
- PVC windows with triple glass low-e
- district heating
- heat recovery system
- solar thermal and PV
- LED
- advanced BAC



Project impacts

RePublic_ZEB has contributed in the following areas:

- creation of a better background for the definition (or the revision of the definition) of refurbishment to nZEB at national level;
- promotion of specific financial incentives for renovation to nZEB.

There are specific examples in the project partner countries.

The project has shown that applying the Italian legislation to the renovation of public buildings requires significant investment, which is generally not affordable by public administrations and

ESCOs in terms of servicing the debt. Following discussions with officials led to a specific financial provision of 200 M€ for public buildings for the period 2016-20.

The Bulgarian partner ascertained that applying the national regulations to nZEB assessments lead to significant variations in the results. Consequently, an amendment that will affect the calculation of primary energy and the share of RES has been proposed. A second proposal aims to introduce more flexibility in the nZEB definition with the use of district heating from cogeneration.

In Romania, the project led to recommendations for the national "*Strategy for mobilizing investment in the renovation of existing national building stock*" and for a higher level of ambition in upgrading the energy efficiency of public buildings. Thus, the project made an important contribution to the definition of indicators for the renovation of buildings and to set the performance requirements in the call for projects under the Regional Operational Programme 2014-20.

The Greek government has delayed developing its strategies to comply with the requirements for nZEB. RePublic_ZEB has put a significant effort to assist both the public sector and the industry to overcome these barriers preventing the rapid uptake of nZEB practices and facilitated the development of nine MOUs signed by public authorities, associations and companies active in the market.

More information?

All of the project outputs including report summaries and a project video are available on our website at www.republiczeb.org.