NEARLY ZERO ENERGY BUILDING AND PASSIVE HOUSE – SUSTAINABLE SOLUTIONS FOR RESIDENTIAL BUILDINGS

Goal of the project

The idea of this project arose from the need to develop energy efficient solutions that reduce the energy need in the Romanian building sector. The main goal of the NEZEBUILD research project is related to the design and detailing of technical solutions in order to achieve the nearly zero energy building standard, resulting in the validation of such designs through extensive monitoring. Design, detailing and execution include the construction elements, finishes and installations system.

Short description of the project

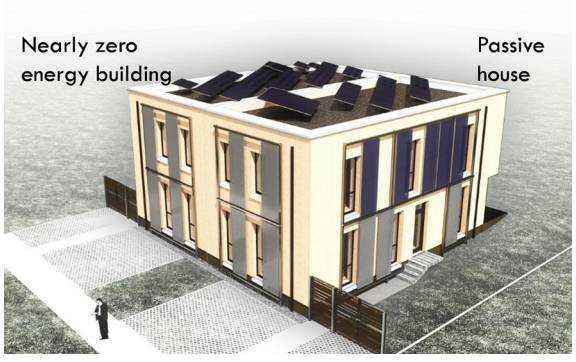
A pilot project was developed consisting in a residential building composed of two detached houses, the passive house (PH) standard and the nearly zero energy building standard (NZEB). The two houses are equipped with monitoring systems. All project activities aim at developing a recommendation design guide regarding PH an NZEB based on experimental research.

Project implemented by

Project Partnership comprising Politehnica University of Timisoara - CCI Department and Arhitim.

Implementation period

2012 - 2016

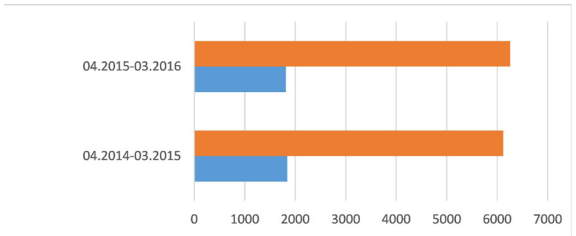


Main activities

- Design and detailing of NZEB system including procurement of materials and equipment.
- Design of the monitoring system and set-up of equipment and accessories for NZEB
- Evaluation of monthly energy consumption for the two houses. Evaluation of main consumption, energy produced and consumed from renewable sources.
- Overall investment cost assessment and lifetime of the building. Analysis of the overall cost of the investment.
- Evaluation of elements with significant impact in terms of environmental protection
- Lifecycle assessment using specialized software SimaPro - LCA with different scenarios.
- Elaborating a comparative PH vs. NZEB study on energy efficiency.
- Dissemination of recommendations and general rules for implementing energy efficient residential houses in the Romanian temperate climate.

Results

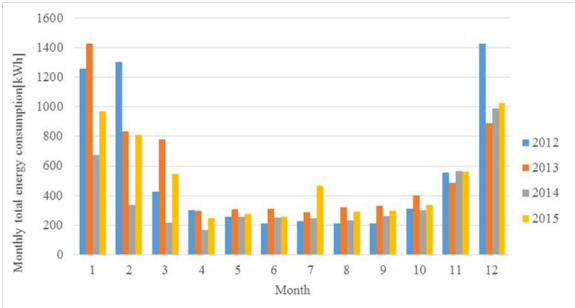
The research project ended in December 2016. The research initiated through this project is continued by the research team. The monitoring process of the two houses continues and also the processing and interpretation of the obtained data. Real time monitoring graphs from the two houses can be viewed online at the address http://www.sdac.ro/site/archives/category/monitoring. The results of the project were published in several scientific paper among which a scientific paper was published in a prestigious scientific journal in the energy efficiency domain. Also, based on the experience from this project, the research team developed o series of guidelines and recommendations useful in the design of energy efficient buildings.



	04.2014-03.2015	04.2015-03.2016
Annual energy production [kWh]	6120	6258
Annual energy consumption [kWh]	1840	1815

Applicability and transferability of the results

The topic of the project is closely related with the increasing concern of nowadays society on reducing the energy consumption in buildings. The targeted groups of the project are scientist, specialists in the energy efficiency field and stakeholders. The project deliverables will assure the transfer of knowledge, generating further „know-how" for scientific community and for practicing specialists (civil and environmental engineers, electrical and energy engineers, architects, technicians).



Financed through/by

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Research centre

Research Centre for Retrofitting of Constructions – RECO, within CCI Department

Research team

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