

EDUCATION FOR THE ON-SITE WORKERS TOWARDS TO THE NEARLY ZERO ENERGY HOUSES

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Summary

There is a need to provide training for on-site workers to successfully meet the requirements of the Energy Performance of Buildings 2010/31/EU (EPBD II) directive [1], which puts high requirements for energy efficiency in buildings to the EU Member States. Ten private and public organizations (also Ministry of Industry and Trade of the Czech Republic) are collaborating on development of the national roadmap for builders' education towards to the nearly zero energy houses and it's implementation in the current education system. The solved project is called Build Up skills.

The main aim of the paper is to introduce the current results of the Build Up skills project in the Czech Republic. The Results will be the national status quo analysis and designed national roadmap for the on-site workers education. The most important points of both parts of the project will be introduced.

Keywords: EPBD II., Education, Nearly Zero Energy Buildings, Sustainability

1 Introduction

The built environment sector and building products producing industries will be significantly affected by the new directive on the energy performance of buildings (EPBD II – Energy Performance of Buildings Directive II), which was published in the Official Journal of the EU on 18th June 2010 under the number 2010/31/EU. EPBD II sets out the 2020 targets of the European Community in the field of energy detailing the development steps to reduce energy consumption of buildings at economically viable investment costs [2]. EPBD II provides for a fundamental obligation to design all new buildings in the "nearly zero" energy standard, namely:

- The new builds of public buildings from 2018;
- All new builds from 2020.

1.1 General trends in building sector

The main trend expected in a building sector is decreasing of the total construction workers number. This trend is mostly caused by the population stability in the Czech Republic, focusing on reconstructions of the current building stock (panel buildings) and construction productivity increasing [4,5].

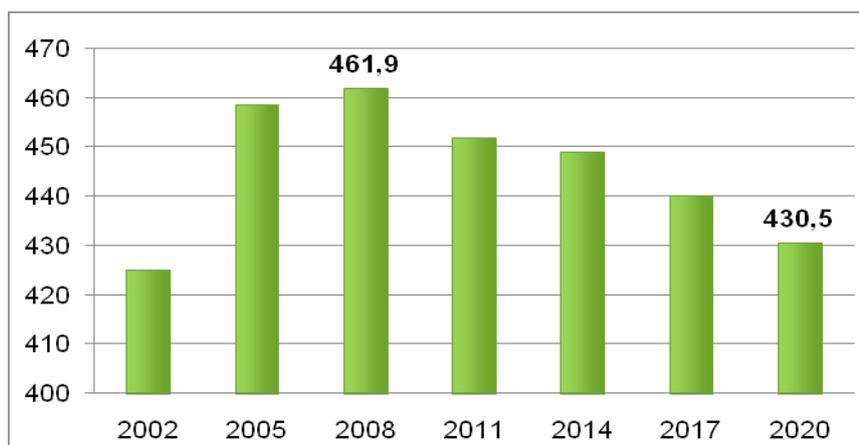


Fig. 1 Projections of employment in building industry in the period 2009–2020 [8, 13]

The current trends in the building sector means that the number of construction workers touched by nearly zero energy building will not strongly increase. The capacity of the current education system for youth is adequate. The focusing towards the 2020 aims will be by education of adults [3].

1.2 Objectives of the paper

The key issue of the Build up Skills project is to find weaknesses of the current education system (the status quo analysis) and to make recommendations (the national roadmap) how the weaknesses should be eliminated. The national and international evaluation of the current state of the art and the recommendations will be a conclusion of the paper.

The main objective of the paper is to describe leakages and make recommendations, how to improve the current education system to be construction workers prepared for the nearly zero energy buildings standard [7].

The methodology is based on dialogue with experts during the workshops and through the questionnaires developed for the specific stakeholders. The dialog will lead to establishing of the national platform for the nearly zero energy houses education.

2 General weaknesses by on-site workers education

During the experts' dialogue and through the questionnaire several weaknesses have been found. The key issues which have to be solved by 2020 are different approaches by high scale, middle scale and small scale buildings, quality and certification of the construction works and building materials, quality of building management and quality of construction works, amount of qualified and skilled construction workers and control system for the nearly zero energy buildings.

The current passive housing has problems with the new technologies and with the new coordination requirements for buildings. During the operation phase of the building the HVAC systems are set up. It needs typically more than one year to set up all the systems to work properly. The technologies and complex systems are not well tested in advance. Very common is the learning by doing approach.

Investors are not generally satisfied with the coordination of construction works (poor motivation of workers), solving the construction details (coming from uncertain project) and function of the handed HVAC systems.

3 Improvement recommendations

Important issue is an identification of professions for education and devise training for individual professions. Following groups of professions were chosen to be educated in different levels of education [10, 11]:

- Masons, plasterers, locksmiths, carpenters, plumbers;
- Technologies + systems building services + RES;
- Electricians (felt weak) + lighting + metering systems and regulations;
- Middle class and higher on site managers.

The selected profession should be designed in a proper system of education (e.g. courses, e-learning, lectures, on-site visit). Accent on coordination of construction works will be very positive. The education system follows quality assurance and quality control, which is the key role of the investors control (TDI). Current state of his education, skills and qualification is not satisfied. The recommendation is to increase roll and quality of the on-site control towards the nearly zero energy buildings [12].

4 Conclusions

Many strong leakages and also positives in the current education system have been found. The most important challenge for all ten project partners is the implementation of current needs in education system and law.

The next step in an implementation process will be the establishing of the National Qualification Platform for the stakeholders. The platform has to provide needed steps for the proper implementation of the national roadmap in the national law, current education system and current certification systems to be on site workers well prepared for the nearly zero energy building.

Acknowledgement

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References

- [1] EPBD II. *Directive 2010/31/EU of the European Parliament on the energy performance of buildings*, Official Journal of the European Union, s. 23.
- [2] ANISIMOVA, N. (2011) ‘The capability to reduce primary energy Demand in EU’, *Housing, Energy and Buildings* 43 (10): 2747–2751.

- [3] BERAN, V., MACEK, D. AND MĚŠŤANOVÁ, D. *Výběr konstrukčních řešení a stavebních materiálů na základě modelových přístupů* [Selection of design solutions and construction materials on the basis of model approaches], Prague 2010: Czech Technology – Technical University Publishing House.
- [4] KAPPELLER, V., *Prefabricated housing renovation of architectural heritage in Vienna and Bratislava*, Stuttgart 2009: Fraunhofer IRB Verlag: 90–104.
- [5] NIEBOER, N.; TSENKOVA, S.; GRUIS, V.; VAN HAL, J.D.M.; FEMENÍAS, P.; et al. *Energy Efficiency in Housing Management*, 1. ed. Abingdon ox14 4rn, oxford: Taylor & Francis Ltd, 2011. 264 p. ISBN 978-1-84971-454-9.
- [6] BÁRTA J., BROTÁNEK J., HROZNÝ J., KECEK P., SOLAŘ M., VŠETEČKA P., *Manuál energeticky úsporné architektury (Manual of the Energy Saving Architecture)*, Prague: State Environmental Fund of the Czech Republic in cooperation with the Czech chamber of Architects, 2010, ISBN: 978-80-904577-1-3.
- [7] Svaz podnikatelů ve stavebnictví a ÚRS Praha (Association of building entrepreneurs of the Czech Republic and ÚRS Prague), *Stavebnictví v kostce 2012*, Praha: SPS a ÚRS, 2012, ISBN 978-80-7369-444-9.
- [8] Svaz podnikatelů ve stavebnictví a ÚRS Praha, (Association of building entrepreneurs of the Czech Republic and ÚRS Prague), *Vize českého stavebnictví do roku 2015 (Vision of the Czech construction industry by 2015)*, Svaz podnikatelů ve stavebnictví a ÚRS PRAHA 2007.
- [9] Česká komora autorizovaných inženýrů a techniků (Czech Chamber of authorized engineers and technicians), *Výroční zpráva za rok 2011 (Annual report 2011)*, ed.1, ČKAIT 2012.
- [10] *Národní soustava kvalifikací (National Qualification Platform)*, 16.8.2012 [cit. 2013-02-1], WWW: <<http://www.narodni-kvalifikace.cz/>>.
- [11] *Národní soustava profesí, (National System of Professions)* 16.8.2012 [cit. 2013-02-1], WWW: <http://katalog.nsp.cz/poziceOdbornySmer.aspx?kod_smeru=41>.
- [12] FIBIGER J., KADLECOVÁ J., PROKOPOVÁ P., at al. *Nadace pro rozvoj architektury a stavitelství, (Architecture and Construction Development Foundation) Výroční zpráva za rok 2010 a 2011 Annual report 2010 and 2011*, part OPPA Crafts.
- [13] Český statistický úřad a Česká komora autorizovaných inženýrů a techniků, (Czech Statistical Office and Czech Chamber of authorized engineers and technicians) *České stavebnictví v číslech 2012 (Czech Building Industry in Numbers 2012)*, Praha: Český statistický úřad, ISBN 978-80-250-2201-6.