



THE USE OF PV IN NET-ZERO ENERGY BUILDINGS: CHALLENGES AND PERSPECTIVES

Jasna Radulovic¹, Milorad Bojic², Danijela Nikolic³, Jasmina Skerlic⁴, Dragan Taranovic⁵

Summary: *From 31 December 2020, all new buildings shall be nearly zero-net-energy consumption buildings (ZNEBs), according to the recast of the European Directive 2010/31/EU. In a Zero-net-energy buildings scenario, Photovoltaics (PV) is very suitable for generating energy, 'on site' and 'at site'. This fact enlarges the perspective of use of PV from the architectural scale to a wider scale, including the space close to the building or even to the urban and landscape scale. The authors of this paper consider opportunities and challenges for the use of PV in ZNEBs and also perspectives for investigating the relationship between PV and ZNEBs.*

Keywords: *Photovoltaics, zero-net-energy buildings*

1. INTRODUCTION

It is generally believed that our climate is changing, and there is a growing concern about the increase in energy use and its adverse effects on the environment. Today, the renewable energy systems have a significant impact on the environment, so the development of renewable energy resources and the use of renewable energy are essential. One of the most promising renewable energy technologies is photovoltaic (PV) energy conversion. PV energy conversion represents the direct conversion of sunlight into electricity. Commercial PV materials commonly used for PV systems include solar cells of silicon (Si), cadmium-telluride (CdTe), copper-indium-diselenide (CIS) and solar cells made of other thin layer materials. PV systems are still an expensive option for producing electricity compared to other energy sources, but many countries support this technology. Over the last five years, the global PV industry has grown more than 40% each year [1]. A radical approach for the mitigation of the energy demand is the concept of the ZNEB [2]. By definition, Zero-Net Energy Building (ZNEB) produces all energy it consumes during year, and yearly electrical energy supplied to the electricity grid balances the amount received from the electricity grid.

¹ Full professor, Jasna Radulovic, Kragujevac, Faculty of Engineering, (jasna@kg.ac.rs)

² Full professor, Milorad Bojic, Kragujevac, Faculty of Engineering, (milorad.bojic@gmail.com)

³ Assistant, Danijela Nikolić, Kragujevac, Faculty of Engineering, (danijelan@kg.ac.rs)

⁴ Researcher, Jasmina Skerlic, Kragujevac, Faculty of Engineering, (jskerlic@gmail.com)

⁵ Assistant, Dragan Taranovic, Kragujevac, Faculty of Engineering, (tara@kg.ac.rs)

