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## TOWARDS NET ZERO ENERGY BUILDINGS: POSSIBILITIES FOR PHOTOVOLTAIC USE

**Abstract:** *There is a growing interest in zero net energy buildings (ZNEBs) in recent years. Several countries have adopted or considering establishing ZNEBs as their future building energy targets to help alleviate the problems concerning the depletion of energy resources and the deterioration of the environment. Also according to the recast of the European Directive 2010/31/EU, all new buildings shall be nearly ZNEBs. In the future, design has to consider not only the space we use directly but also the space required to provide for electrical and thermal energies from renewable sources: the surface necessary for placing the energy generation devices. Photovoltaic has many potentialities in a ZNEB scenario, thanks to its features and enormous decrease in green house gas emissions when they operate. The authors of this paper consider possibilities and perspectives for the use of PV in ZNEBs from different aspects.*

**Keywords:** *Photovoltaic, zero net energy buildings*

### 1. INTRODUCTION

During the last years the attention given to the zero net energy building concept increased. Several countries have adopted or considering establishing ZNEBs as their future building energy targets to help alleviate the problems concerning the depletion of energy resources and the deterioration of the environment. Among different strategies for decreasing the energy consumption in the building sector, ZNEBs have the promising potential to significantly reduce the energy use and as well to increase the overall share of renewable energy. However, in order not to fall short of expectation, there is a need for commonly agreed ZNEB definition framework and a robust 'zero' calculation methodology. According to the recast of the European

Directive 2010/31/EU, all new buildings shall be nearly ZNEBs. In the matter of fact, at the European level, the nearly ZNEBs should be reality in just eight years [1].

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 silicium (Si), cadmium-telluride (CdTe), coper-indium-diselenide (CIS) and solar cells made of other thin layer materials [2].









