

# **PREGLED NESILICIJUMSKIH I NOVIH FOTONAPONSKIH TEHNOLOGIJA ZA GENERISANJE ELEKTRIČNE ENERGIJE**

## **A REVIEW OF NON-SILICON AND NEW PHOTOVOLTAICS TECHNOLOGY FOR ELECTRICITY GENERATION**

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*Solarna energija je najzastupljeniji, neiscrpan i najčistiji resurs od svih obnovljivih izvora energije. Fotonaponska (photovoltaic-PV) tehnologija je jedan od najboljih načina za iskorišćenje solarne energije. Proteklih godina, svetski razvoj fotonaponskih tehnologija raste veoma brzo, upravo zbog tehnološkog razvoja i podrške državnih vlada obnovljivim izvorima energije. Silicijum je vodeći materijal u tehnologiji fotonaponskih solarnih ćelija, upravo zbog svoje visoke efikasnosti. Ovaj rad predstavlja pregled nesilicijumskih fotonaponskih tehnologija, zasnovanih na primeni kadmijum-telurida ((CdTe) i kadmijum-sulfida (CdS), bakar indijum galijum selenida/bakar indijum selenida (CIGS/CIS) i ćelija s fotoosetljivim pigmentima (DSSC). Takođe, u radu su predstavljene i neke nove fotonaponske tehnologije za proizvodnju fotonaponskih ćelija – nanotehnologija ili ‘fotonaponske ćelije treće generacije’.*

**Ključne reči:** fotonaponski paneli; kadmijumske solarne ćelije; bakarne solarne ćelije; ćelije s fotoosetljivim pigmentima; fotonaponske ćelije treće generacije

*Solar energy is the most abundant, inexhaustible and clean of all the renewable energy resources. Photovoltaic (PV) technology is one of the finest ways to harness the solar power. In the recent years, the world's development of PV technology is growing very fast because of the technological development and government support for renewable energy. Silicon is a leading material in PV cells technology, due to its high efficiency. This paper reviews the non-silicon photovoltaic technology, based upon Cadmium telluride (CdTe) and Cadmium sulphide (CdS), Copper indium gallium selenide/copper indium selenide (CIGS/CIS) and Dye-sensitized solar cell (DSSC). Also, it is presented some new photovoltaic technology for PV cell production – Nanotechnology or ‘third-generation PV’.*

**Key words:** photovoltaic; cadmium solar cell; copper solar cell; dye-sensitized solar cell; third-generation PV

### **1. INTRODUCTION**

Photovoltaic (PV) is one of the most prominent renewable energy technologies. Solar photovoltaic technologies are an attractive option for clean and renewable electricity generation – it is the direct conversion of sunlight into electricity without any heat engine to interfere. The PV effect was discovered in 1839 by Becquerel while studying the effect of light on electrolytic cells [1]. Photovoltaic devices are rugged and simple in design requiring very little maintenance. Increasing number of countries is installing photovoltaic solar power plants. The main reason for this is that the use of solar energy contributes to more efficient use of the countries own potentials in generating electrical and thermal energy, reduction of the greenhouse emission, reduction of importing and use of the fossil fuels, development of the local industry and new job openings [2].











