



CORRECTION: RENEWABLE ENERGY AND ENERGY MANAGEMENT'S INFLUENCE ON JOB CREATION

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ISPRAVKA: OBNOVLJIVA ENERGIJA I UTICAJ ENERGETSKOG MENADŽMENTA NA OTVARANJE RADNIH MESTA

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Prestaje da važi *Sažetak*:

Decenijama tokom prošlosti pretpostavljalo se da je zaštita životne sredine usko povezana sa visokim finansijskim troškovima. Međutim, u slučaju obnovljivih izvora energije, veliki broj studija govori suprotno: da veća upotreba energetske sistema, čiji se rad zasniva na korišćenju obnovljivih izvora energije, obezbeđuje ekonomsku korist kroz: inovacije i investicije u otvaranje novih radnih mesta, čime se povećava standard i bruto nacionalni dohodak stanovništva, povećava se sigurnost snabdevanja energijom, te istovremeno štiti ekonomija od političkih i ekonomskih rizika, smanjuje energetska zavisnost i emisija CO₂. Uticaj energetske menadžmenta je veoma značajan za kreiranje novih radnih mesta, posebno u onim regionima čija industrija je bazirana na korišćenju tradicionalnih izvora energije. Obnovljivi izvori energije imaju potencijal da postanu značajan izvor zapošljavanja u Srbiji, otvarajući mogućnost zaposlenja u širokom spektru poslova.

Zamenjen je *Sažetkom*:

Predhodna dva veka ostaće upamćena po značajnim, ponekad revolucionarnim otkrićima, koja su često zasnovana na intenzivnom korišćenju fosilnog goriva, što je dovelo do zagađenja čovekove sredine.

Ubrzan industrijski razvoj zahteva sve intenzivnije korišćenje energetske resursa, čije su rezerve ograničene, tako da se savremeni svet sve više okreće korišćenju obnovljivih izvora energije (OIE). Iako se OIE često povezuju sa visokim finansijskim troškovima, korišćenje ovih izvora energije donosi niz prednosti – smanjenje energetske zavisnosti i smanjenje emisije ugljen dioksida, razvoj lokalne industrije i regionalni razvoj, kao i zapošljavanje lokalnog stanovništva, čime se povećava standard i bruto nacionalni dohodak. U radu je prikazan broj zaposlenih u sektoru OIE u svetu prema tehnologiji koja se koristi i prema izabranoj državi. Takođe su prikazani obrazovni profili zaposlenih u sektoru OIE, ali i radna mesta za koje se smatra da ih je „teško popuniti“.

Prestaje da važi *Abstract*:

For decades in the past it was often assumed that environmental protection inevitably comes with a high financial cost. However, an increasing number of studies are finding precisely the opposite is true in the case of renewable energy: that greater use of renewable energy systems provides economic benefits through investments in innovation, and through new job creation and thereby increases the standard of living, while at the same time protecting the

economy from political and economic risks, increases security of energy supply, reduces the energy dependence and emission of CO₂, increases the gross national income. The involvement of energy management is highly important for the future of creating new employment, especially in the regions whose industrial mix was based on traditional energy resources. Renewable energy sources have the potential to become significant source of jobs in Serbia, opening employment opportunities in a wide variety of jobs.

Zamenjen je *Abstract-om*:

Previous two centuries will be remembered for the significant, sometimes revolutionary discoveries, which are often based on the intensive use of fossil fuels, which has led to the environmental pollution. The rapid industrial development requires a more intensive use of energy resources whose reserves are limited, so that the modern world increasingly turns to renewable energy sources (RES). Although the RES are often associated with high financial costs, the use of these energy sources brings a number of benefits - reducing energy dependence and the reduction of carbon dioxide emissions, the local industry development and regional development, as well as as well as the employment of the local population, increasing the standard and gross national income. The paper presents the number of employees in the sector of renewable energy in the world according to the used technology, and to the selected countries. They also presented the educational profiles of employees in RE sector and jobs that are considered as "difficult to fill".

Ispravke u podnaslovu 1. Introduction

Rečenice u primarnom radu se dopunjuju referencom u ispravci: Illustrative fact is that about 60% of World oil reserves are located in the Middle East, and about 60% reserves of natural gas in just three countries: Russia, Iran and Qatar (based on British Petroleum data, 2009).[1] „Coal reserves are available in almost every country worldwide, with recoverable reserves in around 70 countries. The biggest coal

reserves are found in the United States of America (USA), Russia, China, and India". [2]

Prestaje da važi rečenica u primarnom radu: Coal reserves in the world have been estimated to over 861 billion tones of proven coal reserves worldwide.

Rečenica u primarnom radu se zamenjuje rečenicom i dopunjuje referencom:

According to World Coal Association „proven coal reserves in the world have been estimated to 892 billion tones worldwide".[17]

Prestaje da važi rečenica u primarnom radu: This means that continuing with the current rate of exploitation, exploitation of oil reserves will be exhausted in less than 40 years of gas reserves for 60 years, and coal reserves of about 200 years.

Zamenjuje se rečenicom i dopunjuje referencom: This means that continuing with the current rate of exploitation, exploitation of oil reserves will be exhausted in less than 40 years of gas reserves for 60 years, and coal reserves of about 400 years.[3]

Rečenica u primarnom radu je dopunjena referencom u ispravci rada: „The most serious problem that confronts mankind is the rapid growth of population". [12]

Rečenica u primarnom radu se dopunjuje referencom u ispravci rada: „Under present day actuarial conditions the population eventually would stabilize at around 11 billion by the year 2050". [4]

Ispravke u podnaslovu 3. Job creation in Renewable Energy electricity sector

Prestaje da važi rečenica u primarnom radu: Improving energy efficiency or expanding RE resources reduces the risk of both combusting carbon-based fossil fuels and relying too much of exhaustion of coal, oil and natural gas supplies.

Rečenica se zamenjuje rečenicom u korigovanom radu: Improving energy efficiency or expanding RES reduces the the emission of polluting gases into the

atmosphere and the depletion of the reserves of oil, natural gas and coal.

Naziv slike 1 u korigovanom radu je dopunjen referencom: Picture 1. Renewable energy employment by technology [7]

Rad je dopunjen sa rečenicom: According to IRENA's data (International Renewable Energy Agency), gross global renewable energy employment increased from 1,3 million jobs worldwide in 2004, up to more than 6,5 million jobs in 2013 (Picture 1). [8]

Rečenica u primarnom radu se dopunjuje referencom u ispravci rada: „Solar photovoltaic (PV) and wind power remain the most dynamic RE technologies“. [7]

Rečenice u primarnom radu su dopunjene referencom u ispravci rada: „Most studies conclude that a high proportion of jobs are related to fuel-based technologies. The biofuel sector is estimated to account for almost a quarter of the jobs in the renewable energy industry (1,5 million in 2010)“. [8]

Prestaje da važi rečenica u primarnom radu: The largest number of RE jobs are found in China, Brasil, Germany, India and in USA. (Picture 2)

Navedena rečenica se zamenjuje rečenicom: According to IRENA the largest number of RE jobs are found in China, Brasil, Germany, India and in USA. (Picture 2)

Prestaju da važe rečenice u primarnom radu: The five top Solar photovoltaic – PV cell manufacturers are from China and the USA. The five top wind turbine manufacturers are from Denmark, China, the USA, and Germany.

Navedene rečenice se zamenjuju rečenicamaom: According to IRENA five top Solar photovoltaic – PV cell manufacturers are from China and the USA, and five top wind turbine manufacturers are from Denmark, China, the USA, and Germany.

Rečenica u primarnom radu se dopunjuje referencom u ispravci: These countries offer long - term policy support to

renewable energy, and have significant national markets for the appropriate technologies. [7]

U ispravci rada promenjen je broj reference: "The Economic Benefits of Clean Energy," a report by the University of Massachusetts, determined that:

- „Spending directed toward a clean-energy investment program will have a much larger positive impact on jobs than spending in other areas, including the oil industry even when taking into account all phases of oil production, refining, transportation, and marketing.

- Spending a given amount of money on a clean-energy investment agenda generates approximately 3.2 times the number of jobs within the United States as does spending the same amount of money within the fossil fuel sectors." [9]

Rečenice u primarnom radu se dopunjuju referencom u ispravci: Clean energy jobs:

- Are relatively labor intensive compared to oil production, which is more capital intensive
- Employ more domestically produced content or economic activities". [9]

"Produce far more jobs at all pay levels – higher as well as lower – compared to the fossil fuel industry" [9]

Rečenice u primarnom radu se dopunjuju referencom u ispravci rada: Energy supply systems „employ many people during their life cycle, from construction and operation till decommissioning. Local societies where plants were established, based their development and prosperity for many decades. Table 1 presents the average jobs created by a power plant of 500 MW according to results of Energy Power Research Institute (EPRI), 2001; Renewable Energy Policy Project (REPP), 2001; US Department of Energy (USDOE), 1997)". [10]

U nazivu tabele 1 u ispravci radapromenjen je broj reference: Table 1. Average job creation for a power plant of 500MW in USA [10]

Rečenica iz primarnog rada prestaje da važi: Renewable energy creates more jobs

per GW in construction, manufacturing and installation, and in O&M and fuel processing, than the fossil fuel industries.

Rečenice iz primarnog rada se dopunjuju referencom u ispravci rada, pri čemu je promenjen broj postojeće reference: „Investment in renewables also generates more jobs per dollar invested than the fossil fuel energy sector. The REPP study calculates that the solar PV industry generates 5,65 person-years of employment per million dollars in investment (over 10 years) and the wind industry generates 5,7 person-years of employment per million dollars in investment (over 10 years). In contrast, every million dollar invested in the coal industry generates only 3,96 person-years of employment, over the same time period. [11], [12]

Promenjen je broj reference: „The measurement unit is called "job-years" (a full time employee hired over 12 months) per unit of electricity produced". [13]

Rečenica u primarnom radu se dopunjuje referencom: The large numbers of studies are aimed to assessing the job market of various generation technologies, but most of the researches only assessed limited number of power generation technologies, with heterogeneous measurement units such as: "job-years per peak MW", "job per peak MW", "job-years per peak GWh", "job-years per average MW". [13]

Prestaje da važi rečenica u primarnom radu: Due to that, Wei, Patadia; S., Kammen compare 23 various studies [8] on the job creation potential on renewable energy, energy efficiency, low carbon sources nuclear power, covering nearly all main electricity power technologies on equal footing to calculate average lifetime employment per units of energy.

Rečenica u primarnom radu se zamenjuje rečenicom i brojem reference: In the study about generation jobs in clean energy industry, (Wei, Patadia and Kammen, 2010) compare 23 different studies on the potential for job creation in the area of use: renewable energy, energy efficiency, system whose operation is based on the use of nuclear energy, on an equal

basis to calculate the average lifetime employment per unit of energy. [14]

Prestaje da važi rečenica (u primarnom radu): Table 2, adopted from Wei et al. a detailed job generation summary of the studies analyzed were presented.

Rečenica u primarnom radu se zamenjuje rečenicom: Table 2, adopted from Wei et al. (compares 15 different studies on job creation potential that are shown in the study) shows detailed job generation summary of the analyzed studies.

Prestaje da važi rečenica (u primarnom radu): As it can be seen in the table, some of renewable energy technologies were represented by many studies (wind and solar), some of the technologies (biomass and geothermal) were not represented so frequently, while for some renewable technologies, they were not available (large hydro, bio waste, tidal stream, wave energy). **Rečenica u primarnom radu se zamenjuje rečenicom u korigovanom radu i dopunjuje referencama:** „Some technologies were represented by many studies (solar and wind); some technologies were not studied as frequently (geothermal, biomass)"; [14], [15] while for some renewable technologies were not available (municipal solid waste, large hydro, bio waste, tidal stream, wave energy).

Naziv table 2 dopunjen je referencom: Table 1. Average job creation for a power plant of 500MW in USA [10]

U ispravci rad je dopunjen rečenicom: The reason for the omission of such information could be lack or low weightiness or such estimates are not available.

Rečenica u primarnom radu se zamenjuje rečenicom u ispravci rada: Wei at al. were considered two function job function groupings:

- construction, installation and manufacturing (CIM)
- operations, maintenance (O&M) and fuel processing.

Prestaju da važi rečenice (u primarnom radu): As it can be seen in Table 2, the only renewable energy technology which is not included is large hydroelectric. Lack or the

low relevance of large hydropower for the specific research objective could be the reason for omission of this information.

Rečenice u primarnom radu se zamenjuju rečenicama i dopunjuju referencom: As it can be seen in the Table 2, the highest RES average employment over life of facility has solar thermal technology with result 0,84 job-years/GWh for CIM and 0,57 job-years/GWh for O&M and fuel processing. The lowest RES technology average employment over life of facility has wind technology. There should be noted that average employment for wind technology not explicitly include manufacturing jobs in wind turbine production and thus the job multiplier for CIM is probably an underestimate for direct jobs as defined above. [14]

Prestaje da važi naslov (u primarnom radu): 4. Identification of new jobs in the field of renewable energy

Podnaslov 4. u primarnom radu se zamenjuje podnaslovom: 4. **Employment opportunities in the field of renewable energy**

Prestaje da važi pasus (u primarnom radu): Renewable energy sources have the potential to become significant source of jobs in Serbia, opening employment opportunities in a wide variety of jobs. Employment in renewable energies requires some skills that do not coincide with those related to the traditional sector, thus suggesting the convenience of identifying these new necessities and requirements.

Zamenjen je pasusom u korigovanom radu: Given the current growth in the number of employees in the renewable energy sector in recent years, renewable energy will, in the future probably become a significant source of job creation, and therefore the growth of the world economy. „Employment in renewable energies requires some skills that do not coincide with those related to the traditional sector, thus suggesting the convenience of identifying these new necessities and requirements“. [16]

Pasus u primarnom radu je dopunjen brojem reference: „Average renewable energy jobs are highly skilled, although workers are also needed. Graduates are

needed to fill positions in fields such as engineering, meteorology, project development and research and development, while system design, installation or construction are more likely to require vocational qualifications. For example, drilling and engineering skills are needed for heating and cooling technologies, engineers and technicians will be required to process raw materials and assemble system components. Project development needs qualified personnel to conduct resource assessments, as well as system designers, energy officers, business managers, financial analysts etc. A number of unskilled jobs may be created in construction, transport and administration“. [8]

Naziv tabele 3 dopunjen je referencom: Table 3. Skills and professional profiles linked to a RE employment [16]

U ispravci rad je dopunjen pasusom: Table 4 shows shows the renewable energy occupations identified as "difficult to fill" created as a result of skill shortages. Table 4 was formed by IRENA [7] based on International Labor Organization (ILO) data.

Promenjen je broj reference vezan za tabelu 4. Upisan je broj [7]

Ispravke u podnaslovu 5. Conclusion

Prestaje da važi rečenica u primarnom radu: In this paper, we have shown the perspectives of energy employment generated by renewable energies according to skill requirement analysis which has two levels of specialization, the first relating to engineering and technical skills, while the second refers to installers.

Rečenica u primarnom radu se zamenjuje rečenicama: Industrialized EU countries promote the use of RES to help ensure your job industry. This paper presents the possibilities and perspectives for employment in the field of renewable energy, skills and professional profiles linked to a renewable energy employment and occupations identified as "difficult to fill" as a result of skill shortages.

Ispravke u podnaslovu Bibliografija:

Na osnovu Uputstva za izradu rada za časopis, a na osnovu zahteva da prvi navod u tekstu treba da odgovara prvom imenu sa liste referenci, redosled referenci u radu je izmenjen. U ispravci rada dodato je devet novih referenci.

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Referenca pod rednim brojem 9. IRENA – International Renewable Energy Agency, *Renewable Energy and Jobs Annual Review, 2014* u primarnom radu se u listi referenci u korigovanom radu nalazi pod rednim brojem 7.

Greške u primarnom radu koje je otkrio Centar za evaluaciju u obrazovanju i nauci (CEON) nastale su omaškom u obradi teksta od strane autora. Sa žaljenjem, takođe konstatujemo, da su neke od grešaka koje se odnose na rezerve fosilnih goriva nastale usled mišljenja autora da je reč o opšte poznatim i naučno prihvaćenim činjenicama, te da ih nije bilo potrebno citirati. Zahvaljujemo se Centru za evaluaciju u obrazovanju i nauci (CEON) na pomoći pri otkrivanju grešaka u primarnom radu.