

PRIMENA OBNOVLJIVIH IZVORA ELEKTRIČNE ENERGIJE SA ASPEKTA EKONOMSKE, EKOLOŠKE I SOCIJALNE ODRŽIVOSTI

APPLICATION OF RENEWABLE SOURCES OF
ELECTRICAL ENERGY FROM THE ECONOMICAL,
ECOLOGICAL AND SOCIAL SUSTAINABILITY

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uvod

- › Održivi razvoj energetskeg sistema mora uključivati ekološki, ekonomski i socijalni aspekt održivosti
- › COP 21 (2015) –UN o klimi/195 zemalja o smanjenju globalnog zagrevanja – ograničavanje porasta temp za 2 ili 1,5°C korišćenjem OIE

introduction

- › Sust. Development of energy systems must include ecological, economical and social aspect of sustainability
- › COP 21 (2015) –UN climate/195 countries about global warming reduction– olimiting temperature rise to 2 or 1,5°C by using RES



Aspekti održivosti energetskeg sistema

- › *Ekonomska održivost*: ekonomska efikasnost u svim fazama proizvodnje i eksploatacije energ. sistema
- › Investicije u čistu energiju porasle za 17% u 2014.
- › Odvojena tržišta nafte i OIE-e ne utiču jedni na druge – 20% učešće OIE u proizvodnji električne energije.

Sustainability aspects of energy system

- › *Economic sustainability*: economic efficiency in all phases of production and exploitation of energy systems
- › Investments in clean energy increased by even 17%
- › Markets of RES and oil are separate – 20% share of RES in production in the world electricity production.



Aspekti održivosti energetskeg sistema

- › *Ekonomska održivost:* troškovi proizvodnje energije iz OIEE su sve manji – cena PV modula je opala sa 60%, vetroturbina za 25% (u odnosu na 2009)
- › EE proizvedena iz OIE generiše širok spektar ekonomskih dobiti-radna mesta, spin off benefits itd.
- › Neophodna je kombinacija više vrsta energije –rentabilnost!

Sustainability aspects of energy system

- › *Economic sustainability:* renewable electricity generation costs are dropping each year– the prices of PV modules have fallen by 60% wind turbines by 25% (relative to 2009)
- › Benefits: job creation, spin off benefits, etc
- › Combination of several energy types is necessary – rentability!



Aspekti održivosti energetskeg sistema

- › *Ekološka održivost*: odgovoran odnos prema resursima/glob.zagrevanje, zdravlje ljudi, zagađenje resursa..
- › PROBLEM: korišćenje OIE podjednako štetno na živ.sredinu!?
- › OIE emituju između 400 i 1000g CO₂eq/kWh manje nego fosilna goriva, što je između 14 i 134 puta manje, ne emituju SO₂, NO_x, manja potrošnja vode, problem MHE – ekološki protoci-kum. uticaji

Sustainability aspects of energy system

- › *Environmental sustainability*: responsible attitude towards resources, global warming, health the pollution
- › PROBLEM: harmful use of RES?!
- › RES emit between 400 and 1000g CO₂eq/kWh less than fossil fuels,, which is 14 and 134 times less , zero SO₂, NO_x, emissions, etc.



Aspekti održivosti energetskeg sistema

- › *Social sustainability*: odnos fizičke strukture prema promenljivim potrebama korisnika
- › +/- društveni uticaji + treba ih porediti sa konvencionalnim tehnologijama, podsticanje lokalne ekonomije, energetska samostalnost - problem vetrogeneratora, solarnih polja

Sustainability aspects of energy system

- › *Social sustainability*: relationship of physical structure towards the changing needs of users
- › +/- social impacts – should be compared with conventional technologies, local economy improvement, energy independence – problem /wind turbines, solar fields



Stanje primene OIEE u Srbiji

- › Dobre prirodne pogodnosti-MHE, solarna i energija vetra – decentralizovana proizvodnja EE
- › Stepen korišćenja OIE nizak – prepreke tehničke (imovinsko pravni odnosi, birokratija), socijalne (neinformisanost) i ekonomske prirode (troškovi korišćenja OIE skuplji od konvencionalnih)

Current state in the use of REES in Serbia

- › natural advantages and a good potential to generate electricity from RES
- › the small extent to which renewable energy sources are used – technical barriers (unsolved property-legal relations, bureaucracy), social (lack of information) and economical (costs of RES are significantly higher than the costs of conventional energy sources)



Strateška opredeljenja

- › otvaranje mogućnosti za direktno korišćenje električne energije iz obnovljivih energetske izvora – u skladu sa zahtevima zaštite prirode, kulture i životne sredine
- › Neophodno zbog smanjenja zavisnosti od uvoza – PPRS definisao strategiju/MHE (0,4MTen) solarna (2200h/god) – 0,6MTen) i vetroenergija

Strategic commitment

- › opening up of the possibility of direct usage of renewable electricity-in accordance with the requirements for the protection of natural and cultural values
- › reduce import dependency and the need for new energy sources – SPRS - SHPP (0,4MTen) , solar (2200 h/year- 0,6MTen) and wind energy



Preporuke

- › Prilagodjavanje standarda o GSB zahtevima EU, tehnoekonomska analiza potencijala OIE, jačanje saradnje javnog i privatnog sektora, donošenje strategija za obrazovanje i obuku kadrova, promocija i podizanje svesti stanovništva

Recommendations

- › Adapt standards for the GHG emissions to the EU requirements, perform a detailed techno-economic analysis of RES, feasibility study for fossil fuels including transport, storage, the costs, strengthen the cooperation between the public and private sector, strategy for education and training of personnel who would work in renewable electricity generation systems, promote and raise public awareness



Zaključak

- › Glavna prepreka većem uplivu OIE u ukupnu potrošnju su još uvek neprilagođeni zakonski okviri i neadekvatne stimulatívne politike, predrasude lokalnog stanovništva i dr – SOCIJALNI faktor igra ključnu ulogu u korišćenju OIEE
- › OIE mogu biti ekonomski opravdani i isplativiji od klasičnih izvora – neophodne lokalne inicijative za korišćenje

Conclusions

- › The main barriers to greater share of RES consumption lay in still not adapted legal framework and in inadequate stimulating policy, and prejudice of the local population - SOCIAL factor is the has the main role in RES implementation
- › RES can be econolically justified more economically viable than conventional energy sources – local initiatives needed



Hvala ! / Thank you!

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