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Mikro elektrarna – pot k zadostitvi električnih potreb naših domov

Cene energentov, tudi električne energije, nezadržno naraščajo iz leta v leto. Bližajo se časi, ko bodo mikro elektrarne tudi ekonomsko zanimive. S kombinacijo npr. sončne in vetrne energije, bi lahko v veliki meri zadostili potrebe po električni energiji v naših domovih. S kompenzacijo lastnega odjema elektrike v naših domovih bi si lahko bistveno znižali strošek električne energije. Navkljub dejstvu, da se podpore RS proizvedeni energiji iz obnovljivih virov iz leta v leto nižajo, se investicija v mikro elektrarno izplača pred desetimi leti obratovanja. Podpora se torej še naprej niža, strošek oz. prispevek za rabo obnovljivih energetskih virov pa se na naših položnicah veča.

Pred koncem lanskega leta, 28. 11. 2012, je vlada RS sprejela spremembe Uredbe o podporah električni energiji, proizvedeni iz obnovljivih virov energije. Za sončne elektrarne, ki bodo vključene v elektro omrežje RS po 1. 12. 2012, uredba določa 2 % mesečno zniževanje podpore. S 1. 1. 2013 pa na novo uvaja 5% bonus za tiste sončne elektrarne, katerih skupna moč ne presega 5 kW. Zahtevan je tudi t.i. priklop »za lastnim« števcem stavbe, ki omogoča lasten odjem pred oddajo proizvedene električne energije v omrežje. S tem ukrepom uredba vzpodbuja vključitev mikro sončnih elektrarn v interno omrežje končnega odjemalca – uporabnika, torej lastnika stavbe, kar je bilo do sedaj le izjemoma dovoljeno.

S kombinacijo sonca in npr. majhne vetrnice bi lahko na ugodnih lokacijah razširili proizvodnjo tudi v nočni čas in tako pokrili lastne potrebe po električni energiji doma tudi v nočnem času. S takšno kombinacijo, na primer 3,5 kWp sončne in 1,5 kWp vetrne elektrarne, bi ostali znotraj 5 kW skupne moči. Investicijska ocena takšne kombinacije je okrog 11.300 €. V mesecu januarju je trenutno veljavna podpora zagotovljenega odkupa (ZO) 0,147 €/kWh in 5% bonus za moči do 5kW. Upoštevamo življenjsko dobo solarnih modulov - 25 let. Upoštevamo še 0,5% propad izkoristka sončnih modulov letno. Upoštevana življenjska doba vetrnice pa je 25 let brez padca izkoristka. Na koncu upoštevamo še prodajo električne energije po 15-tih letih proizvodnje po ceni 0,065 €/kWh in letno stopnjo rasti cene 1 %. Izračuni, upoštevajoč navedene podatke, kažejo, da je donosnost takšne naložbe bistveno višja (več kot dvakrat), kot na primer varčevanje sredstev v bankah. Doba vračanja take naložbe je med 7 do 11 let, odvisno od tega, kako smo se sposobni prilagoditi lastni porabi in s tem kompenzaciji lastnega odjema. To pomeni, da svojo porabo v največji možni meri prilagajamo v čas lastne proizvodnje.

Tako v Evropski uniji, kot tudi v Sloveniji, prihajajo časi, ko bo kombinacija sončne in vetrne energije postala najcenejši in najbolj ekonomični vir električne energije v naših domovih. Zato ne bo več optimalno izkoriščati ves razpoložljiv prostor na lastni strehi, ampak le toliko, da zadostimo lastnim potrebam – do 5 kW instalirane moči, kar zadošča porabi povprečne 4

- članske družine. S takšno investicijo bi vsekakor razbremenili tudi okolje in hkrati vzpodbudili rodnost v Sloveniji, torej da bi spet prišli do povprečne 4 – članske družine.

Bralce obveščamo, da se nam je pri tisku naše revije JET, št. 3/12 zgodila neljuba napaka, saj je bil pomotoma objavljen tekst članka z naslovom: *Dež kot zeleni energetski vir?*. Pravilni tekst objavljamo v tej številki – članek z naslovom: *Generični model za kreiranje lopatic vetrnih turbin*, avtorjev G. Hren, I. Žagar in A. Predin. Za neljubo napako se vam opravičujemo.

Krško, februar 2013

Andrej PREDIN

Micro-power plants – meeting the electrical needs of our homes

Energy prices, including electricity, are rising steadily from year to year. The time when micro-power plants will become economically appealing is approaching. Through a combination of solar and wind power, they could essentially satisfy the demand for electricity in our homes. By offsetting the consumption of electricity in our homes, we could significantly reduce the cost of electricity. Despite the fact that the support of the Republic of Slovenia for renewable energy has been on a downward trend, an investment in micro-power can be returned over ten years of operation. Support therefore continues to decrease, although the cost of contribution for the use of renewable energy resources has increased.

Late last year, the Republic of Slovenia adopted amendments to its regulation on support for electricity produced from renewable energy sources. For solar power plants connected to the electrical grid, support has decreased by 2%. Starting in 2013, there is a new 5% bonus for solar power plants with a total power up to 5 kW of installed power. Furthermore, a so-called connection "after own" building meter, which enables the electrical energy produced to be consumed before being transmitted to electrical grid, is required. With this measure, connections of the micro-solar power plant systems to user's internal electricity grid are now encouraged, whereas they had previously rarely been allowed.

The combination of solar power and small wind turbines (on favorable locations) could expand the household production of electricity throughout the entire day. For example, a 3.5 kWp solar and 1.5 kWp wind turbine could yield 5 kW of total power for an initial investment evaluation of around €11,300. In January, the current support guaranteed purchase price is € 0.147/kWh, and a 5% bonus for solar power plants up to 5kW of installed power. The estimated lifespan of solar modules is up to 25 years, with a 0.5% efficiency decrease per year. In the calculations, the estimated lifespan wind turbine is 25 years without falling efficiency. Finally, we take into account the sale of electricity after 15 years of the production up to €0.065/kWh and annual growth rates of 1%. From calculations taking into account the above data, it is shown that the return on such investment is substantially

higher (more than twice) than the interest offered on deposits in banks. The return on investment period is between 7 and 11 years, depending on how we are able to best modify our consumption of electricity according to our production.

A time is coming when a combination of solar and wind energy will become the cheapest and most economical source of electricity in our homes, in the European Union, as well as in Slovenia. Therefore, the optimal utilization is not all the available space on the our roof but only as much to meet our own needs – up to 5 kW of installed power capacity is enough to cover the needs of the average four-member family. Such an investment would certainly provide relief to the environment.

Announcement to Readers: In our print magazine JET, no. 5-3, there was an error, showing an article entitled *Rain as a green energy source?* The correct text is, in fact, published in this issue, now entitled *Generic model for wind turbine blades design* by G. Hren, I. Žagar, and A. Predin. We apologize for this unfortunate error and any trouble it may have caused.

Krško, February, 2013

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