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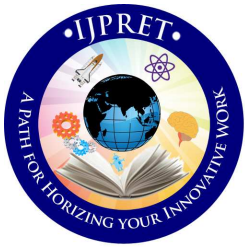

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A PATH FOR HORIZING YOUR INNOVATIVE WORK

LED SYSTEM SOLAR LIGHTING IN SHTIMJE

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Abstract

Renewal of public street lighting in the Kosovo is carried out according to a calculation of project streat light in Shtimje, putting into use the existing metal poles of the street lights for some streets and complete construction of the rest of lights with the adapted system of LED type, in order to meet the requirements of the lighting system. Solar panels are as a source of profit and the partial replacement of electricity production from fuels with fossil-organic origin that pollute the environment. Maintenance of the solar system, life expectancy of illuminating lamps, the low consumption of LED lamps and batteries from the solar system are benefits to utilizing this network. Illumination is determined by the illuminated surface, reflection of the illuminated surface and the direction of the reflected light. In the experimental procedure, in this project were used data of temperatures measured by the Kosovo Institute of Meteorology for the city of Shtime and harmonization of standards according to European directives.

PURPOSE

This paper will be presenting the generation of electricity from solar energy, its impact on the energy system, as well as policies and concrete experiences of the application of solar energy for electricity production. The main focus is the efficient use of solar energy, which can contribute significantly to the security of supply of electricity and thermal energy of the sun. In light of these changes today, starting with the implementation of solar LED lighting systems, with the increase of energy efficiency and fair approach to the environment. European standard requires especially precise definition of lighting performance, implementation and measures taken by the light. In addition, the grade is determined by the brightness that depends on the purpose of the illuminated area of the environment. Today, there are two approaches to determine the lighting class included in these standards. The first has to do with the main road network in order to stay requirements based on the brightness-luminance (cd/m2). The second refers to all other areas of all types and purposes that is based on lumen light (lx ≡ lux).

INTRODUCTION

Energy requirements in a global level, distressing impacts posed to the environment and society as a whole, fossil burnings are dominant on 30% more than it was at the time of the first industrial revolution. What more impresses of course is the fact that the speed of increasing the level of carbon dioxide has increased exploitation of renewable energy needs by solar energy. Researching results evidenced that the Republic of Kosovo is likely to benefit from solar energy which is renewable energy and environmental cleanliness. From results generated from this research with specific activities in certain places being put into use as a very necessary matter and essential to have energy advantage with all its production capabilities and for technology processes development needed for the country . With the use of solar energy will have a positive effect on the environment, increased energy manufacturing capacity for the state, financial savings of the companies that will utilize these services in energy savings, increased employment of population, etc.Geological knowledge of humans over the world for millions of years show that the world never and in no period increased so quickly, as it is experiencing in these recent times. But the

effects and direct influences of humans to these positive changes are completely visible and evident. There is no doubt that human beings have made changes to the atmosphere from the burned gases and chemical substances.

Technological development and research are at a very high level and the industry is in an enviable position on the basis of the benefits that will bring in the future. This general guidance is designed to be an effective means for the maintenance, use and strengthening Euro leadership in the photovoltaic energy sector. Every year photovoltaic energy industry is advancing rapidly. From 2000 to 2007, the industry grew by 40%, and is one of the fastest growing energy industry. In 2007, total production of energy from photovoltaic energy amounted to 3 GW, worth $ 14 billion. Photovoltaic industry employs more than 119 000 workers[1]. Photovoltaic industry targets are: 12% of final energy requirements in the European Union which should be achieved by 2020. Based on the parity of the networking (when electricity is equal to or lower than the current price of electricity), EPIA has shown that photovoltaic energy market within the European Union will present about 60% of electricity demand in 2020. Foremost of all this is the raise of energy prices in different countries of Europe and Photovoltaic prices decline by 20% for every doubling of their production capacity. Countries like Italy with high brightness and high electricity prices is thought to achieve parity of Networking in 2010. This parity of networking will cover all the European Union countries by 2020. In order to achieve this objective, photovoltaic energy industry needs not many technological changes but some simple technological improvements.

Acceleration in the reduction of the price will be affected by the economic rate of various European countries. It is absolutely vital and reasonable if it is possible that in the 27 countries of the European Union to become a special support program, ideally in a structured form, matererially be positioned in Economic Benefits and modern technology development. Also, for the next few years, due to the clean economy and new jobs increases of this sector will provide economic development policy with new and sofisticating techniques. Production lines are constantly being added, while employment in the solar energy sector in Europe reach the number of 20 000 employees. With the expansion of the sector, the number

of employees will increase to half a million in just a few decades to come[2].

Radiation of the sun of photovoltaic technology

Sun, earth or solar radiation is the main source of energy for life and our planet. Radiant power varies depending on geographical location, climatic conditions, seasons or even days. The power of solar radiation in the world shows that solar energy is an inexhaustible source of energy production, solar energy resources are 86 000 TW as long as the worldly use is about 15 TW, so if you achieve caughting only 0.02% of solar resources would have been sufficient for the entire world supply. Solar radiation is a form of nuclear energy, which is formed through the fusion of hydrogen atoms that as the process goes on helium[3].

Concentrated solar collectors require large areas aproximately 1 km2 for every 20-60 MW. The material used for sun collectors is often dangerous for personnel who work with them because it contains arsenic and cadmium.

Solar energy today is mostly used for heating the water because it is more efficient and cheaper. Based on the surface of the Earth (510.1 10^6 km^2) we can conclude that we are dealing with large amounts of solar energy (about 10^9 TWh/ year). Because of sunny days per year (from 365, 285 days of sunshine are possible). The use of solar energy is realized through the establishment of solar collectors as in Figure 1.

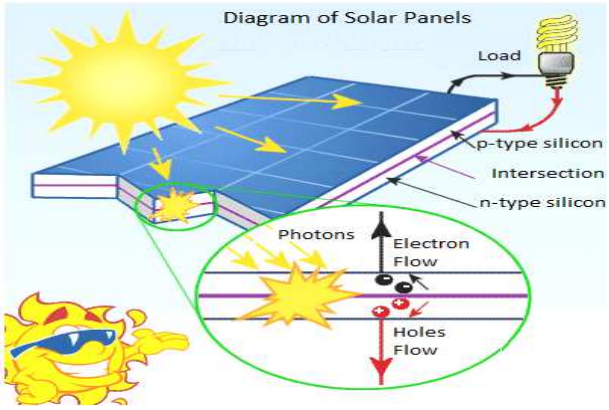

Figure 1 Solar radioation with sun collectors

The amount of solar energy is virtually unlimited source and available in every country. Therefore it is easily big enough a distribution and power generation much closer to the customer, anywhere in the world[4]. Electricity from the sun is a technology that is well known to all, such as photovoltaic energy which permeates up to 1.4 kW of energy per 1 m2 of the Earth's surface. Passing through the earth's atmosphere 0.4 kW (30%) of the solar energy is absorbed and only 1 kW (70%) falls to 1 km2 of

the Earth's surface. Solar energy spread on the surface of the land, depending on geographical latitude, season of the year and the length of the day[5]. While passing through the atmosphere a part of the solar energy is absorbed by the rays (oxygen, water vapor, carbon dioxide), a part reflected (in the molecules of gases, particulate matter and dust), and a part is riemmited. Solar energy power reduction during passage through the atmosphere depends on the weather conditions (clear, partly cloudy and completely cloudy), the pollution of the atmosphere and the sea height[6].

Solar controlled systems

Solar resplendence of roads are products of high quality, high performance and advanced technology systems which are structural components consisting of electric systems, solar lights. All measured systems are subject to strict scrutiny photovoltaic performance, to provide an analysis of the performance characteristic of the functioning of this efficient and profitable component and to ensure efficiency and reliability for shorter-term investment of this teknologjije . Controlling systems are determined and committed with high reliability for a system proper performance of solar energy which is called the photovoltaic system, the characteristics of the battery, wiring with lighter specifics, in order to be the maximum control of components with optimal balance. To minimize inefficiency, minimizing physical size and reduce overall costs[7].

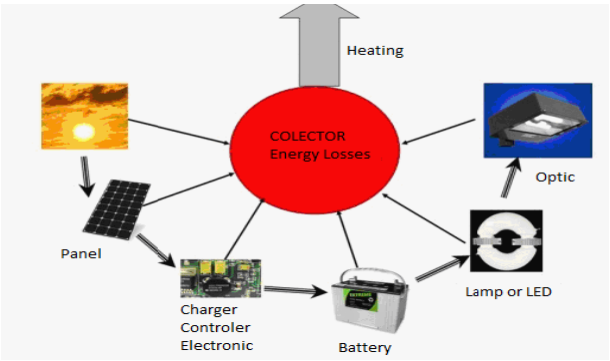

Figure 2 Control of the solar system

In tabulation of fotovolatike solar radiation with numerical values Table 1, we will use the data of the resplendance of the sun's radiation which are measured by metrology institute of Kosovo, these data as such we consider shade structures with local influences in the region of Ferizaj as station Meteorology Office of the Republic of Kosovo. Such groups are sized systems with high electrical load, which reports provide electrical integrity with photovoltaic systems. These reports are evaluated at the time when there is less sun during winter and increased demand for electricity when network

loads are greater as the rays of the sun are in the northern hemisphere starting from December 21.

Table 1: Measured values of solar radiation in Lumen 2010.

I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Yearly Average
-6.6	0.91	5.50	11.16	15.82	17.99	22.85	20.59	16.43	11.41	9.43	3.64	10.90

Thanks to database of Hydro Meteorological Institution for these data are calculated average sunning amounts and the number of sun hour's sunning for 2010. Meteorological station in Ferizaj region which also includes Shtimje, where orthography of these spaces - localities is different, as well as the sea heights are different which results in variation of parameters with different numerical values. In Figure 1 are presented monthly temperature settings from Hydro meteorological station in Feriziaji where the city of Shtime is part of the Region.

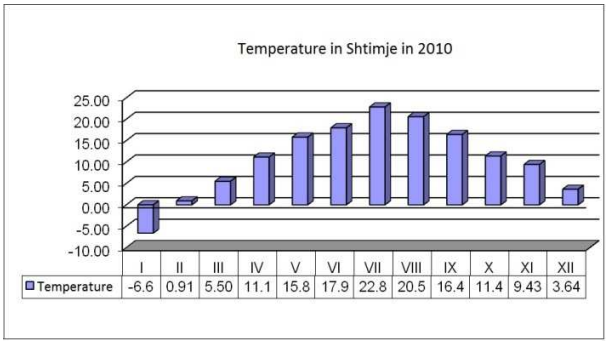

Diagram 1: monthly temperatures for the City of Shtimje for 2010. .

The ability to have proper resplendence and solar easier light fixture on public roads is the interaction of many factors whose balance determines the proper interaction between them.

In Table 2 are presented the main variables that include: visibility, aesthetics, type in wat installations, energy efficiency, light(easy) pollution, risk and safety at work[8].

Renovation of Public street lighting

Map No. 1 presents the basic design done based on projects mission, are taken into account the recommendations of the International Committee for outdoors resplendence, resplendence CIE as important information for calculating photometric and E2 classification according to CIE 126-19907.

Map 1: Roads of Shtimje according to zones A, B, C, D, E, F and G, resplendence is a fundamental parameter of a reflected light radiation that is perceived by the human eye. Measurement is done photometric defined as the ratio of lighting intensity per unit area.

Complexity determined by the illuminated surface, reflecting illuminated surface and the direction of the reflected light.

Software package DIA Lux is used for controlling the intensity resplenders HPS-150 W fitting with resplenders LA-50 W LED QTY 50 values required for this type of road as per class grade standards ME 4a cd / ≥ 0.75.

In Table 2 are presented solar photovoltaic cells unit that will be conform to EC Directives 89/33/EEC,Standard EN 50081-1 and 50082-1 1992 and 93/68/EEC and the requirements of IEC 61215.

Photo panels voltaik type SR05-165 will be silicon cells multi crystalline, laminated between sheets of ethylene-vinyl-acetate (EVA) and 3 mm glass hardened with a little iron of high conductivity, dimensions 1580 x 808 x 35 mm, or similar, suitable depending on the specific conditions of manufacturers including the following characteristics, measurements according to ASTM E 1036:

Table 2: Characteristics of photovoltaic cells

Maximum Power	**165 W**
Voltage in Pmax	35.6 V
Current in Pmax	4.65 A
Short circuit current	5.2 A
Short circuit voltage	43.2 V
Temperature coefficient	0.065+-20mV/ºC
System maximum voltage	1000 V TUV Pheinland

Modules will have confirmation regarding suitability test use during the installation, and also resistance to all weather factors such as

wind, rain, snow, etc.. Solar panels are installed on the roof of the metal tower with reinforcing structure. Panels holders must prevent the rain water from penetrating or water from the melting snow.

The battery should be destined to save electricity and to supply electricity in a timely manner, with no need for maintenance, lead-acid batteries 120Ah/12V - 2 units located in the box.

Controller / regulator to optimize the process of loading / discharge of the battery and extend its lifespan, Battery status is reflected in a liquid crystal indicator. The function of the regulator is to protect the system from short circles, free flow, the process of loading / unloading excessive. The microprocessor controls charging with temperature compensation and determining the level of loading (charging). .

Electrical installations as part of the solar system between solar panels, battery and regulator from the conductor 2 x 2.5 mm2 given with resplending troops models as in Figure No. 3 [9].

Figure 3 Model MBEL-SSLD60W

1. Solar Module: 100WP / 12VDC * 2pcs
2. Solar Module of opposite side: 100WP / 12VDC * 2pcs
3. Battery: free-preserving of battery- acidic battery100AH/12V * 2pcs
4. Battery box : 100AH/12VDC * 2pcs
5. Controller/Regulator: 15A/24VDC
6. Light source: String light for easy strets 60W/12VDC
7. lumen brightness: 5400-6000 LM,
8. Center lux: 28-30 lux base over 8m)
9. Installations and other installed material

10. Metal poli: 8 - 9 m
11. Working temperature: - 40 ° C ~ 55 ° C Era-stand> 120 km\h

Operating Time: 10-12 hours / day, keeps 3 rain days[9].

Renovation of public street lighting in Shtime / field-assessment road 1 / observeri 1 / connecting lines - (L)

Figure No. 4 is shown the rate of flow of light on the surface of the earth, between the pillars and the height according to the position of lights that are placed around on the metal columns[9].

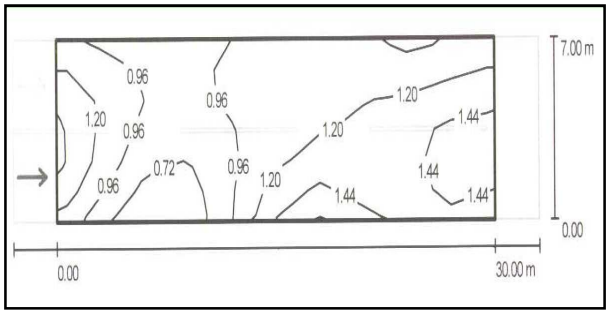

Figure 4 Lighting flow distribution parameters.

Values in sparking plugs/m2, scale 1:258 in Table 3.Network: 10 x 6 point, observer position: (-60 000 m, 1750 m, 1500 m) Track:R3,q0:0070

Table No. 3: values of obsever in sparking plugs [9].

	L_{av} [cd/m^2]	U0	Ul	TI [%]
Values calcultated	**1.12**	**0.4**	**0.4**	**9**
Values required as per class ME4a	**≥ 0.75**	**≥ 0.4**	**≥ 0.6**	**≤ 15**
Filled in /not filled in	**yes**	**yes**	**no**	**yes**

CONCLUSIONS

Architectural trends are rising quality of lighting, lower energy consumption, creating a functional and reliable operation over time. As a solution and a great opportunity to benefit is the type of LED lamp which is called by the name "Light Emmiting Diode ", based on LED technology white color last layer is paved with one or two coats of yellow phosphorus which blue light source gets the green light. LED lamps today have a cold hole or better say moderate white usability of 120 lm / W, while predictions go over 150 lm / W. In this way it is possible a functional lights competition with modern natrium lights high pressure sodium 200 lm / W[10]. Today the world needs more renewable energy and Utilizing solar energy source which has about 86000 TW unused energy. Continued population growth brings more and more

demand for energy. Modern science is looking for resources to meet the needs of humanity, there are times when energy demand is reduced temporarily (finanaciare global crisis and global recession). In the longer term the world today is need for more renewable energy and in particular to avoid the effects of fossil fuels mostly coal, oil and natural gas. Fossil fuels are harmful to the environment due to release large quantities of carbon dioxide (CO2), environmental pollution in the form of oil spills at sea, causing smog, which is very harmful to health. Today more pronounced effect and concern is global warming, which is created from fossil fuels, at the same time is the biggest challenge of mankind in its history [11]. In the Republic of Kosovo, the legal and regulatory infrastructure for renewable energy sources should be unified as that of the European Union in compliance with the respective subsidies directives and energy efficiency law that is introduced by the European Union for BER and their further institutional development until 2020.

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