Innovative Technology of Increasing Solar Cells' Efficiency

Nioradze, Giorgi
Kontridze, Vakhtang

Our goal is to improve mainstream solar cells with only 18% efficiency – it's a major problem in physics, because 'green' energy will one day replace fuel-based machines on global market for being eco-clean and inexhaustible. We hope to supply even more households with free electricity without any extra material costs. Last year we presented a theoretical study of the phenomena and didn't have the physical product itself exhibited. This year, however, we have not only managed to create it , but also design a factory-conveyer-device which could manufacture them automatically. It's scientifically proven fact that solar cell's efficiency dependence on sunlight intensity is not linear, but an ascending curve (Efficiency vs Intensity graph). We aim to increase efficiency during Encapsulation – process known to the world, that involves covering cells with silicone membrane to protect it from damage. Before encapsulating, we're modifying silicone by pouring it on a microscopic mold, which has a negative, inverted shape of the final product. Since silicone is already used in manufacturing, we don't pay for new material. With 3D printer we're creating a structure resembling lined-up set of cylinders where individual cylinder from the front view is either a semicircle, segment or ellipse. Because of this shape silicone gains optical abilities - it's able to focus (redistribute) sunlight so, that one strip on cell is illuminated, while another strip is darkened. And like that, alternately. Of course, redistribution can't 'add' sun-rays, but the trick lies in nonlinear efficiency graph: solar cell transforms solar energy into electricity and on illuminated area we 'profit' more in conversion, than we lose on darkened part. Thus, we managed to increase efficiency by 5%.

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