Solar Powering Day and Night with Boxed Micro-Biosphere

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Solar power is an important green energy, but it is almost impossible to generate electricity using a solar PV panel at night. We thus developed a Bio-photovoltaic “Boxed Micro-Biosphere” (BMB) to generate electricity day and night. BMB can transform solar energy into electricity and stably supply power day and night. However, the BMB with only Chlorella generates unstable electricity. When symbiotic bacteria (Sym1) was added to this BMB, the voltage fluctuation was reduced by 69.5%. Even at night, the BMB with Sym1 still maintained 92.1% of the daytime voltage. Furthermore, BMB could generate power day and night and maintain 93.1% of the daytime power even at night in a light plant incubator. Under real sunlight, the BMB could still generate power and maintain 90.8% of the daytime power at night. In sum, we developed a BMB with the capability to stably generate electricity day and night. Even at night, the BMB can maintain more than 90% of power under the scorching sun. With these advantages, BMB has the potential to help with the construction of solar power plants without an expensive energy storage system. Finally, the cost of BMB is extremely low ($0.80/module).

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