

SOLAR POWER AND LED LIGHTING: NEW OPPORTUNITIES FOR AFFORDABLE INDOOR LIGHTING OF RURAL FAMILIES IN BASE OF THE PYRAMID CIRCUMSTANCES

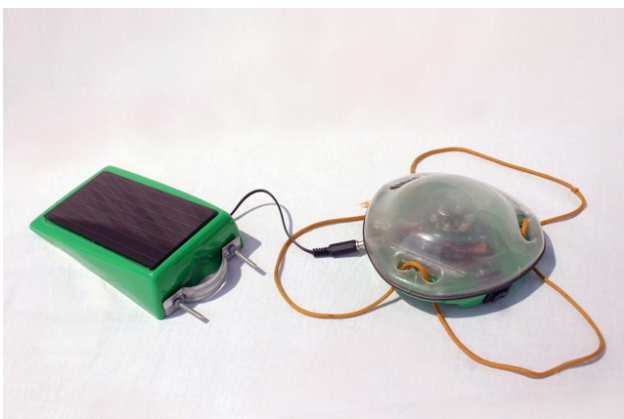
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Lighting, communication and water supply are generally considered to be the major domestic applications of solar electric systems in rural areas in developing countries. Though at present most solar powered lighting systems and solar lanterns use compact fluorescent lamps (CFLs). Current market prices and long-term technology roadmaps of light emitting diodes (LEDs) indicate that white LEDs become more and more a serious alternative for CFLs in solar applications. LEDs have, more than CFLs, the opportunity to be applied in low-power indoor applications, making it affordable for a wider target group of poor families. Since solar powered LED lighting will be dominantly applied in a domestic setting, our paper strongly focuses on human factors of lighting. It is argued that an acceptable minimum requirement for the illumination level of domestic lighting could be 30 lux. For this reason a 1 Watt LED connected to a small solar panel of typical 1 Wp could provide enough electricity or three to four hours of lighting in most of the developing countries. Such a small solar powered LED lamp including a rechargeable battery would have a retail price within the purchase power of families living in "base of the pyramid" circumstances. Our paper demonstrates new opportunities for affordable and mobile lighting systems and is illustrated by conceptual designs of affordable solar powered LED lighting systems or the case of rural Cambodia.



Progress in LED-development enables affordable domestic lighting with solar power for rural families living in "Base of the Pyramid" circumstances in Cambodia.