

Design, Characterization and Modelling of High Efficient Solar Powered Lighting Systems - DTU Orbit (09/11/2017)

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This paper discusses some of the major challenges in the development of L2L (Light-2-Light) products. It's the lack of efficient converter electronics, modelling tools for dimensioning and furthermore, characterization facilities to support the successful development of the products. We report the development of 2 Three-Port-Converters respectively for 1-10Wp with a peak efficiency of 99.1% at 1.5 W output power at PV to battery and almost similar characteristics for a 10-50 Wp. Furthermore, a modelling tool for L2L products has been developed and a laboratory for feeding in component data not available in the datasheets to the model is described. A living lab facility is realized to field test prototypes of L2L lighting products in their development state to validate the modelling tool and tweak the parameters in the system for optimized performance the product. Finally, the model was validated against a field test from the living lab over a four-day period with an offset of 5.3 %

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