

A Photovoltaic Micro-Storage System for Residential Applications

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Abstract : In this paper, a PV micro-storage system for residential applications is proposed. The term micro refers to the size of the PV storage system, which is in the range of few kilo-watts, compared to the grid size (~GWs). Usually, in a typical load profile of a residential unit, two peak demand periods exist: one at morning and the other at evening time. The morning peak can be partly covered by the PV energy directly, while the evening peak cannot be covered by the PV alone. Therefore, an energy storage system that stores solar energy during daytime and use this stored energy when the sun is absent is a must. A complete design procedure including theoretical analysis followed by simulation verification and economic feasibility evaluation is addressed in this paper.

Keywords : battery, energy storage, photovoltaic, peak shaving, smart grid

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