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Topic:

Field Experience

Kind of Presentation:

oral

Titel:

The Future of Village Electrification- More than two Years of Experiences with AC-Coupled Hybrid Systems

Abstract:

The motivation for the development of a special battery inverter, like the Sunny Island, was to lower the investment and operation cost for hybrid systems. Now two years after starting the serial production of Sunny Islands a lot of experiences have been made in the field. These experiences will be shown in this presentation. At first an overview of more than 30 realised hybrid systems, their structure and the very different areas of application will be described. Operating results like availability, typical failures, operating conditions, charge regulation, state of charge calculation, and so on will be presented.

A very important point for a high economic efficiency is a good design for the hybrid system. Most systems with problems in operation or a very poor performance are badly designed. In order improve this situation and to support the hybrid system designers and installers SMA developed a comprehensive set of design rules. First results for designing a high efficient and profitable hybrid system will be presented.

Finally an outlook for the technological development and the general future of village electrification with AC-coupled hybrid systems will be given.

A selection of the applications with Sunny Island

Application	Typ	PV with Sunny Boy	Battery	Genset	Country
1 Power Supply for a farmhouse	1 ~	2,2 kWp	490 Ah	—	Greece
2 Water Supply for a village	1 ~	6,0kWp	800 Ah	—	Thailand**
3 Power Supply for a flat	1 ~	—	775 Ah	3,7 kVA	North Italy
4 Stromversorgung für Ferienhäuser	3 ~	6,6 kWp	800 Ah	9 kVA	Greece
5 Stromversorgung für Ferienhäuser	3 ~	6,0 kWp	800 Ah	—	Greece
6 Village Power Supply in North India (Himalaya)	3 ~	7,5 kWp	500 Ah	100 kVA	India***
7 Emergency Power Supply for a Hotel	3 ~	—	190 Ah	9,4 kVA	Germany*
8 Power Supply for a Car Repair Station	3 ~	—	800 Ah	30 kVA	Germany*
9 Power Supply for a museum boot	3 ~	6,0 kWp	800 Ah	55 kVA	Germany
10 Power Supply fo a Hospital	3 ~				India
11 Power Supply for holiday houses	3 ~	PV und Wind			South Africa
12 Power Supply for a flat	3 ~	1,7 kWp	450 Ah	8 kVA*	Germany

* cogeneration

** a couple of 1 one phase pumping system

*** two three phase Island Grids

Example for a parameter variation to find the most economic design for a PV hybrid system on the Philippines:

