

DEVELOPMENT OF OPTIMISED CONTROL CONCEPT FOR DECENTRALIZED PHOTOVOLTAIC HYBRID SYSTEMS

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Keywords: battery management, energy generation cost, hybrid systems, island systems performance, operation control

ABSTRACT

Nowadays, decentralized photovoltaic hybrid systems have gained increasing acceptance on the distributed power supply market. However there are still some drawbacks in their performance which mainly arise from conventional operation control strategies. This paper presents an advanced control strategy of the supervisory controller of the decentralized PV hybrid systems. The basic objectives of the developed control concept are to achieve consistent technical and economical operating conditions for the system components, especially for the battery and the back-up genset. A dispatch decision module is designed on the basis of event driven mechanisms. Also, the constraints imposed on the components operation have been taken into account. Simulation results illustrate that longer lifetime of the battery is rather achieved via the developed operation control concept than via conventionally used ones. Continuous checking of the actual status of the system components, especially the battery state of health and the loading ratio of the genset allow efficient use of their characteristics to reduce the levelized energy cost.