

Pricing-based energy management strategies for hybrid energy systems and mini grids

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Abstract:

Energy management systems (EMS) play an important role in hybrid systems and mini grids. The task of an EMS is the long-term strategic control to optimize the utilisation of generators and storage systems. An EMS aims at the reduction of lifecycle costs, wear out and an optimized utilisation of renewable energy sources. The concept of pricing describes the calculation of real-time energy prices for single generation components depending on the generator characteristics, technical states, maintenance costs, wear out and fuel costs. The concept of pricing is an promising approach to comply with the needs of future EMS that have to deal with changing infrastructures, billing systems, active load control and demand side management.

This work shows the results of the development of a pricing-based EMS in the EU-project “Mini Grid Kit”, the concepts of pricing, load- and resource predictions, generator control, demand side management and billing.