An adaptable agent-based control model for rural electrification for small wind and solar hybrid off-grid systems

Abstract:
This paper presents a multi-agent control system for off-grid power management in wind-solar hybrid energy systems, with special focus on rural electrification. The underlying framework is designed with special attention on modularity and adaptability. The light-weight implementation ensures optimal functionality on low-cost, low-performance hardware essential for cost minimization in rural contexts. The power management method is based on multi-agent systems (MAS) utilising the Belief-Desire-Intention (BDI) paradigm. The proposed MAS for power management context comprises solar, wind, battery storage, load and central controller (MGCC) agents. The design process and communication structure of the agent-based system are presented.

Stichworte:
agent-based modelling, energy management, rural electrification, off-grid, hybrid renewable energy system, C++

Dewey Dezimalklassifikation (Liste):
620 Ingenieurwissenschaften

Kongress- / Buchtitel:
World Small Wind Conference 2017