

OPTIMIZATION OF RENEWABLE ENERGY SOURCES FOR A DATA CENTER USING ENERGY STORAGE

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The growing use of information technology in many sectors, such as banking, e-commerce, entertainment and health care, to name a few, led to a rapid development of data centers, due to the need to increase processing capacity. Consequently, the management of processes and IT systems and data centers is emerging as an area whose environmental impact requires increased attention to the efficient energy consumption.

With depleting conventional energy resources, whole world is now looking for alternatives to meet energy demands. One of the solutions is renewable energy which is non-exhaustible and non-polluting, but problem is intermittent nature of these energies.

In this communication, we propose to study the management of a hybrid energy source system that deliver power for a datacenter. The system is composed of several energy technologies and back-up as well as energy storage units. The storage devices can be a battery bank, supercapacitor bank, or a fuel cell-electrolyzer system. Other energy sources are considered such as wind turbine and/or photovoltaic panels.

The problem addressed in this work is a hybrid renewable energy system and the point is to manage the energy production system with the objective to satisfy a load demand and to minimize the power exchanged with the grid. A mixed integer linear program is proposed to solve the addressed problem.

