

This paper proposes a single-agent system towards solving energy management issues in solar microgrids. The proposed system consists of a photovoltaic (PV) source, a battery bank, a desalination unit (responsible for providing the demanded water) and a local consumer. The trade-offs and complexities involved in the operation of the different units, and the quality of services' demanded from energy consumer units (e.g. the desalination unit), makes the energy management a challenging task. The goal of the agent is to satisfy the energy demand in the solar microgrid, optimizing the battery usage, in conjunction to satisfying the quality of services provided. It is assumed that the solar microgrid operates in island-mode. Thus, no connection to the electrical grid is considered. The agent collects data from the elements of the system and learns the suitable policy towards optimizing system performance by using the Q-Learning algorithm. The reward function is implemented by fuzzy system Sugeno type for improving the learning efficiency. Simulation results provided show the performance of the system.