ABSTRACT

HOME ENERGY MANAGEMENT SYSTEMS AND METHODS

Home energy management systems and energy management methods for a smart home are described. The smart home has an electrical grid connection, a renewable energy source which provides a time varying electrical power output, a battery energy storage system, and a plurality of electrical loads. A home energy management system for the smart home comprises: a processor which implements a reinforcement learning agent trained to select control actions for the battery energy storage system and the plurality of electrical loads which minimize an objective function dependent on an energy cost parameter, a comfort metric of the smart home and a degradation metric of the battery energy storage system; and a controller configured to control the battery energy storage system and the plurality of electrical loads according to the control actions selected by the reinforcement learning agent.

[FIG.2 to be printed with Abstract]