

ABSTRACT

A power management system is provided, which is electrically coupled to a photovoltaic array, a power grid, and a battery, and includes a power converter, and a processing module. The power converter is configured to operate in one of operation modes, including a self-consumption mode, a Time of Use mode, and a backup mode, to regulate power flow among the photovoltaic array, the power grid, and the battery. The processing module is configured to generate, through a forecast model, predicted data representing power demand, power generation of the photovoltaic array, and tariff of the power grid over a first time period; determine one of the operation modes to be a target mode for the power converter and a corresponding switch time based on the time series of predicted data; and control the power converter to operate in the target mode at the switch time.

Fig. 2