was too expensive and not too reliable, has prevailed over the years among many decision makers, in spite of the tremendous progress PV technology has made in recent years in terms of cost, efficiency and reliability.

Progress in materials technology, electronics and PV systems engineering, along with a drop in price of the main components of the PV system and a better understanding of the needs and expectations of the rural people, have resulted in a large variety of ideas, proposals and technological schemes to use photovoltaics as a source of electricity to promote human and economic development in rural areas of the developing world. A large number of applications have been identified for PV systems in rural areas, some more mature than others in technical terms, but all facing similar problems to enter the rural market on a massive scale.

23.3.1 PV Systems for Rural Applications

PV systems for remote applications typically include three basic elements: one PV panel that converts solar radiation into electricity, a means to store the electricity produced by the PV panel, which is normally an electrochemical battery, and an electronic device that helps control the flows of electricity within the system, thus protecting the battery by properly dispatching available energy. A variety of devices capable of using electricity to provide comfort, entertainment and other services for the benefit of the user are then attached to the PV system by means of the electronic charge controller (ECC). Figure 23.1 shows a schematic diagram of a general PV system. Depending on the application, some elements of the PV system may not be necessary, as is the case of the battery in water pumping systems.

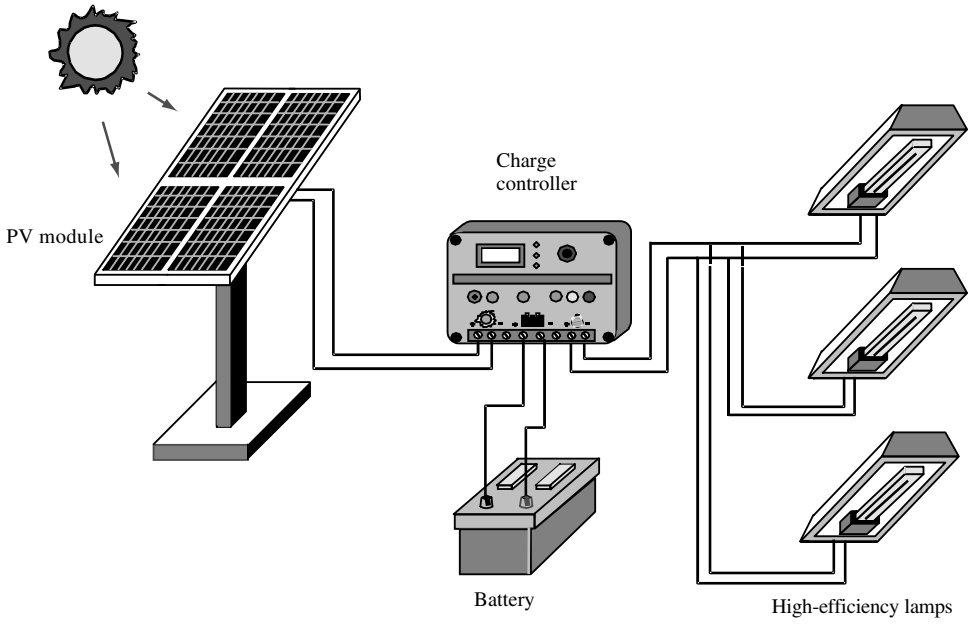

Figure 23.1 Schematic diagram of a general PV system