



Figure 17.15 PV-Diesel-Hybrid system in Llavería (Source: TTA, Barcelona)

17.2.2.5 Photovoltaic pumping systems

An important field of application for battery-free solar electricity systems are water-pumping stations [15]. In this case, water reservoirs serve as product storage devices.

High-power pumps are applied to draw drinking water from great depths for a whole village. The system shown in Figure 17.16 supplies the drinking water for 4000 people on Sumba Island in Indonesia. Using a 6-kWp photovoltaic system, 40 m³ water can be drawn every day.

17.2.2.6 Photovoltaically powered water purification

Besides the water provision, the purification of water also becomes increasingly important (see Figure 17.17; [16–18]). Different technologies exist, like chlorination, UV radiation and ozonisation. From this broad range of purification methodologies, the best-suited system has to be chosen and integrated in a complete photovoltaically powered system for continuous and safe operation.

17.2.2.7 Social aspects in off-grid rural electrification

Providing stand-alone photovoltaic systems for remote locations is often defined and approached as a purely technical matter. However, in numerous applications such as mountaineering lodges, rural households or village power supply systems, it has become clear that other aspects in addition to the technical ones affect the optimum use and effective conversion of solar energy into electricity [8]. There is a danger that expectations of a photovoltaic system will be unrealistically high. It cannot really be compared with the “inexhaustible” supply known from the public grid, but must be placed in a realistic perspective defined by the respective context. This must happen actively and consciously as many users (and also planners) of photovoltaic systems underestimate the amount of redundancy, safety precautions and maintenance work necessary to achieve the high level of safety and reliability afforded by the centrally administrated public grid. This means