A simple PV ventilation system was used to enhance the performance of roof solar collector (RSC) for reducing heat gain and increasing the ventilation rate inside houses. The RSC is composed of CPAC Monier concrete tiles at the outer side, air gap and gypsum board at the house side. The PV system consists of one PV panel (27 Wp), a DC electrical fan (7.3 W) installed in the gap of RSC and a control unit.

Field testing results showed that the average temperature gradient between CPAC tiles, gypsum board and room was low, about 7 °C, demonstrating a high heat gain reduction. The temperature of gypsum board was very close to the indoor temperature. The average PV powered air flow rate and the corresponding air change per unit RSC were about 100-250 m³/h and 3-8 ACH, respectively. Such rates are 2-4 times higher than those obtained with the natural ventilation induced by RSC. In addition, PV-powered RSC is an interesting option in the sense that it promotes solar energy and conserve energy.