

Abstract

Building consumes significant amount of energy. It is important to reduce resource utilizations of a building as well as to improve energy efficiency. Roof and walls are two of the most important envelop of a building, and their structure and material of choice affect the building energy efficiency significantly. The present invention provides a multiple functional roof and wall which combines photovoltaic, or PV in short, for electricity generation, solar heating or cooling all as one building material. The objective is to reduce material usage while generating electricity and thermal energy in one installation of a building. Ease of installation, cost effectiveness, and durability are also key considerations.

Figure 10