

A preliminary assessment of load consumption and solar power potential at Kota Belud, Sabah

ABSTRACT

This paper presents a detailed preliminary assessment of load consumption and solar power potential at the Eco- Tourism Centre of Liogu Ku Silou-Silou (EPLISSI), Kota Belud, Sabah. This initial investigation assessed the feasibility of an off-grid solar PV system at EPLISSI with a suitable solar panel system for project installation and commissioning purposes. Due to the absence of an electrical grid and power supply, no pre-existing electrical appliances could be found in EPLISSI. Hence, an excel-based software, the ESCoBox, was used to produce the load profiles. The input data for this software came from a list of required electrical appliances (LED lights, fans, and phone chargers) and the historical frequency of visitors to EPLISSI. Meanwhile, to assess the solar power potential at EPLISSI, an online simulator known as Global Solar Atlas version 2.3 or GSA 2.3 was used. As an input for the GSA 2.3, the initial solar panel system capacity was set for 0.5kWp, and then an increment of 0.1kWp was entered until specific criteria were met. The selection of the suitable size is made when the system can satisfy the daily total average load demand and a specific load fulfillment demand. As a result, it was found that the site requires a total average demand and a total peak demand of 4.60 and 11.87kWh/day, respectively. From the GSA 2.3 generated report, an off-grid solar PV system with the capacity of 2.50kWp solar PV can satisfy the daily total average load demand of this area, where the average PV energy output is within the range of between 7.74–9.80kWh/day or an average of 8.72kWh/day. In conclusion, this preliminary assessment indicates that installing an off-grid solar PV system in this area is possible.