



IIIv05-001

An evaluation of the utilization of solar power generation both ac and dc to enhance life quality of insulated communities.

Alves, J.A.(1); Mucsi, C.S.(1); Rossi, J.L.(2); Kanayama, P.H.(3);

(1) IPEN; (2) IPEN-CNEN/SP; (3) Fatec Itaquera;

The electric power availability for insulated communities both geographically and after major disasters is a recurrent problem throughout the world even in modern days. Nowadays the availability of silicon solar electric generating panels is widely available in a wide range of quality, translated into prices, as well as all the ancillaries needed to put up a solar power generating system in operation. Solar panels generate direct current that may charge batteries or be converted to alternating current both with its characteristic circuit losses; usually DC to AC conversion present losses and generate harmonics that may be inserted into sensitive common domestic appliances like radios; even so, most electronic gear usually reconvert AC to DC for its operation. So choosing the right powering system may provide a less expensive and more efficient way to provide quality of life for insulated communities. This paper present preliminary results on the comparison between a DC and an AC systems for the powering of usual domestic appliances as well as report a former experiment to evaluate the effect of time on the perception of the users and the concerns associated. Two power-generating systems were conceived and installed in a habitation, one of then for DC generation and the other an AC generation system. Both systems were aimed to power equivalent loads and equipment. A field visit was made to an insulated community in order to collect data about the usability, concerns and operation of a photovoltaic system offered to them some time ago. Results of the comparison between AC and DC powering systems are mixed; the DC system had a low initial price but the appliances are more expensive and not readily available and its maintenance more difficult. Otherwise the AC powering system behaves in the opposite direction. The choice is solely based in the availability of appliances and ancillaries and financing options.