MODELLING OF THE SOLAR ENERGY INCOME FOR BRAŞOV URBAN AREA-SOLAR POWER

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In a good design of solar power systems, the objectives which must be reached are the minimization of the overall cost and the maximization of the energy performance of the system. In this way, the paper proposes the analysis of the solar energy income for Braşov urban area. The diagrams presented are obtained on the basis of the meteorological data recorded for three years 2006-2008. The used meteorological data, for this study, were recorded with a local weather station positioned on the roof of the Transilvania University of Braşov.

The information about solar radiation, from the collection and processing meteorological data is directly usable in the synthesis of the tracking discreet programs for the oriented PV panels and the oriented solar thermal collectors.

Quick accessibility to high quality meteorological data facilitates the efforts on designing and developing various renewable energy systems.

Knowledge of the solar radiation available on the earth's surface is essential for the development of solar energy devices and for estimating of their performance efficiencies. For this purpose it is helpful to study the attenuation of direct normal irradiance by the atmosphere, in terms of fundamental quantities, including optical thickness, relative optical air mass, water vapor content, and aerosol amount [1].

Solar radiation is a driving force behind a number of solar energy applications such as photovoltaic systems for electricity generation, solar collectors for heating, solar air conditioning climate control in buildings and passive solar devices. Thus, the determination of solar radiation data is important. Solar energy is free, its supplies are unlimited and using solar energy produces no air or water pollution.

Taking into consideration the data above, the solar radiation data should be measured continuously and accurately over the long term.

In order to calculate the performance of an existing system or the energy generated from a system in the design stage, appropriate weather data have been required. In this regard, an analysis of the influence of the measurement interval of solar radiation and a good fit for the data measured in a typical energy system is of paramount importance, not only with regard to technical reliability but also in the minimization of total system cost (kWh costs).

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