

SISTEMA FOTOVOLTAÍCO DE ENERGIA APLICADO À UM SISTEMA DE IRRIGAÇÃO

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The increasing use of electric energy increases the search for diversification of the energy matrix, especially those from renewable sources. This project aims to generate knowledge and a possible implementation of a renewable source that has been gaining market in recent years, called photovoltaic, because in addition to reducing the environmental impact caused by the burning of fossil fuel is also competitive financially in relation to other existing renewable sources. This theme choice came from the need of certain regions from the north of Brazil to receive quality electricity, more precisely, the city of *Curuçá*, in the state of *Pará*, where is located an *açaí* plantation, the object of the research, being essential the climate study of this municipality, verifying the advantages and disadvantages of the project application. It is intended to present a satisfactory proposal through solar energy that will replace the continuous use of diesel oil, commonly used in these regions; because in most cases the electricity from the concessionaires is still unfeasible. The designed system converts the solar energy, captured through photovoltaic silicon plates, into electricity that feeds a water pump for irrigation. For this, it is known that the type of *açaí* planted in this land is CHUMBINHO and that in general this *açaí* plantation requires 100 to 120 liters of water per clump daily. Solar panels, water pump, load controller and inverter will be dimensioned. General aspects of photovoltaic generation are presented, explaining the principle of operation, how they are manufactured; it is also defined the types of solar cells and how the photovoltaic modules are electrically characterized. The different ways of obtaining the maximum power point in the photovoltaic panels are explained, and the Solarimetric map of CRECESB is used for this proposal. The same will be done for the pump, controller and inverter in order to explain the operation of each system component; then it is intended to size the power required for the pump to effectively irrigate the plantation, being necessary to know the size of the plantation, as well as the depth and diameter of the well from which the water will be extracted. Knowing the power of the pump, the calculations will be made to size the required quantity of solar panels. With the number of panels and their layout on the ground, the cost for the project implementation will be calculated, comparing to the currently cost with the fuel use and, through charts and tables, it will be demonstrated the advantage of using the energy generation through solar irradiation.

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