Energy production is a challenge that has been of great importance for many years. Come. Indeed, the energy needs of industrialized societies do not stop. Increase. In addition, more energy to achieve the development that developing countries will need. The promotion of renewable energies is essential to ensure sustainable development and reduce poverty while leaving a viable environmental legacy for future generations. Since the dawn of time, humanity has lived to the rhythm of the moon and the sun. Some civilizations have challenged them. At the base of the development of the first structured human societies, we find techniques related to natural energies whose engine is the sun. It is therefore important to think about the design of systems using this freely available and inexhaustible quantity of resources. Historically, when the development of solar energy has reached a level of maturity allowing its large-scale use, it aims at mini-grids concentrated on entire villages and areas where technical solutions for mass electrification are proposed. Solar photovoltaic is growing for use in electric power sources as it has advantages including low maintenance costs and environmentally friendly with abundant and free energy. The purpose of this study is to analyze the energy consumption of a school in the center of Çankırı using the PVsyst V6.88 software. The energy produced by the school system must be designed to meet the requirements of a photovoltaic system. It aims to make a simulation where evaluations can be made on the compatibility of the found elements with each other. In this study, the idea of ​​placing grid-connected photovoltaic panels on the roofs of five buildings of Uluyazı Campus of Çankırı Karatekin University is discussed. The system design process in the PVsyst program includes the following basic steps: Project-Define location and meteorological data, Orientation-Define module azimuth and tilt, System-Choose system modules, inverters and the electrical design, Near shadings-Design the system layout in 3D and select the shadings calculation method, Module layout-Module layout ready for the electrical shading calculations and Simulation-View a summary of the production design system energy.

In the literature, there are many studies on PV systems. The general objective of these studies is to determine the potential uses of PV systems, the losses in PV systems and how these losses can be eliminated, and to perform an applied analysis of PV systems used in buildings. Some of these studies are discussed below. The purpose of photovoltaic systems is to convert sunlight into electricity. A photovoltaic system connected to a building can be autonomous (eg electrification of isolated sites) connected to the network. In the latter case, the electricity can be resold to the local electricity company produced. In our work, we will focus only on grid-connected photovoltaic systems.

PVSyst Software, When opening PVsyst, you access the main page: this gives access to the four main parts of the program: "Pre-project" is a section designed to quickly assess the potentials and possible limits of a project in a given situation, "Project design" is the main part of the software and is used for the complete configuration of a project, "Databases" include climate data management, which consists of synthetically generating hourly values and to retrieve external data and the "tools" provide additional tools to visualize the behavior of a solar installation. So for the design and simulation of the most realistic result in the studies, the "Project design" section should be selected and the new project should be decided. When a grid-connected system design is desired, the "Grid-Connected" section should be selected. Then after selecting en should be added Çankırı to PVsyst as a new region. For these reasons, the databases are clicked on the main screen of PVsyst, then "New" is selected among the geographical regions and the region is positioned interactively. After clicking on the "Import" button, the distribution of the region's weather data by month is displayed directly. We see that the project was defined after the selection of the geographical region. With this region selection, it is necessary to save the active project. Then we must make our project with: Orientation, System, Near Shadings and Modül layout for each building, while the orientation: as in the preliminary design section, here we will select the orientation (tilt and azimuth of the panel). We choose here 2 different types of decorations in addition to those seen previously: fixed titled plan and unlimited hangar (unlimited hangars), the System: this step for the connected network is broken down into five subsections: selection of the inverter "inverter ", selection of the photovoltaic module "selection of the module" (select the modules) wiring diagram of the modules "network of modules", calculation of the losses and "expression of the need". Near Shadings: To calculate the shading factor at any given time based on the position of the sun, a full 3D representation of the area and its surroundings is needed. The 3D representation of the buildings was mainly created using building plans and Google Earth and Modül layout: In the module layout, the user has the possibility to recreate the PV area where each module is represented. Once all the system modules have been placed, the electrical configuration of the field can be defined. Each module is assigned to a string, which is then automatically assigned to an MPPT input. After setting the system parameters, I click the Run Simulation checkbox to start the simulation. Once the simulation is complete, a report will be available for viewing and printing. Finally all these explanations must be made one by one for five buildings, it’s in the Uluyazı Campus of Çankırı Karatekin University, these five buildings are: the faculty of engineering, the faculty of sciences, the faculty of dentistry, the faculty of Letters and the faculty iktisad, so using Google Earth Pro, the latitude and longitude values ​​of the corners of the areas to be used to position the panels on the roof are noted, these values ​​are then transferred to the Pvsyst program using CSV format.

During the simulation, PVsyst calculates several loss parameters, in the first step of the simulation the program will evaluate the beam component as a function of the horizon line, resulting in a full or no beam depending on whether the sun is overhead from the horizon. Or not. After that, the shading factor close to the beam component is applied. Therefore, when the sun is below the horizon, there will be almost no loss of shading because the beam is zero. In other words, potential near shadows for sun positions that are already affected by the horizon will not produce additional losses. The metrics we have allow us to analyze in detail various aspects of the actual functioning of the system. Detailed comparisons with the simulation should make it possible to identify certain parameters and sensitive points of the functioning of the simulation, but will also lead to the suspicion of uncertainties in the measurement. All the data of the Faculty of Engineering, the Faculty of Science, the Faculty of Dentistry, the Faculty of Letters and the Faculty of Economics and Administrative Sciences have been obtained, and the total module area of ​​all Study buildings is 2411.5 m², cell area is 2152.7 m², and the number of modules is 1474. In this study, at first, the simulation was performed under the normal conditions of a project work, using the module parameters according to the manufacturer and keeping the "module quality" parameter at its default value, and the results were obtained in the form of reports.

PVsyst is software that allows designing and implementing a photovoltaic solar system at a given building load. Scan results are useful for providing information about system performance and power consumption. A total of 1474 modules were used for the Solar Energy System designed for five different buildings at Uluyazı Campus of Çankırı Karatekin University. The total area of ​​the modules is 2411.5 m². 83 inverters are preferred for these modules. The total installed power was 391 kWp. It is known that a 300 kWp system can produce around 500 kWh of electricity per year.