

Project name: Feeding electrical engineering laboratories with solar energy.

Start date: 9/1/2017

End date: 11/20/2017

Project stages:

- ❖ Preparing designs for steel structures.
- ❖ Implementation of steel structures.
- ❖ Installing solar panels on steel structures,
- ❖ Design and implementation of relay controls.
- ❖ Installing and wiring the components of the solar system (solar panels, integration boxes, charge controllers and inverters).
- ❖ Connecting the batteries of the independent systems.
- ❖ Configuring the settings of the charge controllers and inverters.
- ❖ Examination of the systems and starting into actual service.

laboratories:

- 1- Communication Lab.
- 2- Control lab.
- 3- Electronics Lab.
- 4- Computer Lab.
- 5- Electrical foundations laboratory.
- 6- Electrical Power and Machinery Laboratory.
- 7- Complex systems laboratory.

Supported systems:

1- Independent solar energy systems to cover the loads of control laboratories, computers, communications, electronics, electrical foundations and complex systems. These systems consist of:

- Solar panels: 36 panels with a capacity of 250 watts
- Panel Integration Box: To combine 10 strands of solar panels in parallel
- Charger: 15 kW capacity, 96 volts, 150 amps
- Battery bank: 8 batteries connected in series. The capacity of each battery is 150 Ah
- Inverter: capacity of 10 kilowatts with 96 volts continuous and output 220 volts / 50 Hz.

2- A solar energy system connected to the grid to cover a portion of the machinery laboratory loads. This system works only in the presence of the national network and it consists of:

- Solar panels: 36 panels with a capacity of 250 watts
- Inverter: capacity of 15 kilowatts with a maximum voltage of 900 volts.

3- The hybrid solar energy system also to cover a portion of the loads of the three-phase machinery laboratory.

This type of system relies on solar energy and energy stored in batteries and that taken from the grid to meet the requirements of the electrical load according to a pre-prepared sequence. This system consists of:

- Solar panels: 36 panels with a capacity of 250 watts
- Battery bank: 4 batteries connected in series. The capacity of each battery is 250 Ah
- Inverter: Works with and without the network and they regulate the built-in charger. The maximum input voltage for this inverter is 900 volts.

4- Solar energy system that adopts induction motors. This system was adopted in the capacity and machinery laboratory to feed some of the experiments of this laboratory. It depends on:

- Solar panels: 18 panels with a capacity of 250 watts.
- Inverter: 5.5 kW three-phase induction motors drive.

1 - The photo of the solar panels:



2- Autonomous solar systems in the control lab







