

Grid-connected solar
photovoltaic power generation system

Grid-connected EPC System



Engineering Procurement Construction Mode

Photovoltaic power station refers to a photovoltaic power generation system that uses solar energy and special materials such as crystalline silicon plate, inverter and other electronic components to connect with the power grid and transmit power to the power grid.

Photovoltaic power station is a green power development energy project with the greatest encouragement from the state.

EPC Mode is also known as the integration mode of engineering, procurement and construction.

It refers to that after the decision-making stage of the photovoltaic power station project, an engineering company is entrusted to carry out the general contracting of design procurement construction from the beginning of design through bidding.

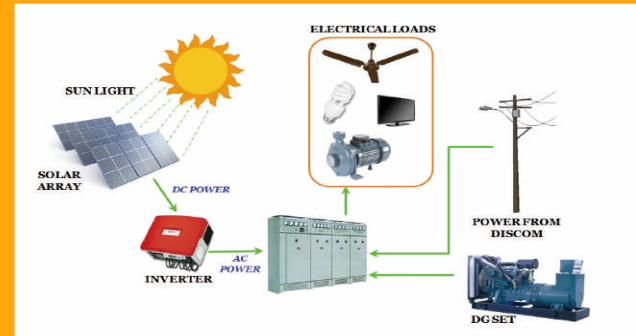
In this mode, according to the total price or adjustable total price specified in the contract, the engineering company is responsible for managing and controlling the progress, cost, quality and safety of the project, and completing the project according to the contract.

Grid-connected solar photovoltaic power generation system

WHAT IS GRID-CONNECTED SOLAR PHOTOVOLTAIC GENERATION SYSTEM

The grid-connected solar photovoltaic power generation system is composed of photovoltaic cell array grid connected inverter, which directly inputs the electric energy into the public grid through the grid connected inverter without energy storage by the battery.

Compared with the grid-connected solar photovoltaic power generation system, the off-grid solar photovoltaic power generation system saves the process of battery energy storage and release, reduces the energy consumption, saves the floor space and reduces the configuration cost.



THE CLASSIFICATION OF GRID-CONNECTED SOLAR PHOTOVOLTAIC GENERATION SYSTEM

(1) Grid-connected photovoltaic power generation system with countercurrent

When the electric energy generated by the solar photovoltaic system is sufficient, the remaining electric energy can be fed into the public power grid to supply power to the power grid (sell electricity); When the power provided by the solar photovoltaic system is insufficient, the electric energy will supply power to the load (buy electricity).

Because the direction of power supply to the power grid is opposite to that of the power grid, it is called countercurrent photovoltaic power generation system.

(2) Non countercurrent grid-connected photovoltaic power generation system

The solar photovoltaic power generation system will not supply power to the public grid even if the power generation is sufficient. However, when the power supply of the solar photovoltaic system is insufficient, the public grid will supply power to the load.



(3) Switching grid-connected photovoltaic power generation system

The so-called switched grid-connected photovoltaic power generation system actually has the function of automatic operation and two-way switching.

First, when the photovoltaic power generation system is insufficient due to cloudy, rainy days and its own failure, the switcher can automatically switch to the power supply side of the power grid and supply power to the load from the power grid; Second, when the power grid is actually powered off for some reason, the photovoltaic system can automatically switch to separate the power grid from the photovoltaic system and become the working state of the independent photovoltaic power generation system.

Some switching photovoltaic power generation systems can also disconnect the power supply for general loads and connect the power supply for emergency loads when necessary. Generally, switched grid-connected power generation systems are equipped with energy storage devices.



(4) Grid-connected photovoltaic power generation system with energy storage device

It is to configure energy storage device according to needs in the above types of photovoltaic power generation systems. The photovoltaic system with energy storage device has strong initiative. In case of power failure, power restriction and fault in the power grid, it can operate independently and supply power to the load normally. Therefore, the grid connected photovoltaic power generation system with energy storage device can be used as the power supply system for important or emergency loads such as emergency communication power supply, medical equipment, gas station, refuge indication and lighting.

THE COMPONENTS OF GRID-CONNECTED SOLAR PHOTOVOLTAIC GENERATION SYSTEM

1: Solar panel



Solar panel is the core part of solar power generation system. The function of solar panel is to convert the light energy of the sun into electric energy, output DC and store it in the battery. Solar panel is one of the most important components in solar power generation system. Its conversion rate and service life are important factors to determine whether the solar cell has service value.



2: Inverter

The direct output of solar energy is generally DC 36V to DC 48V. In order to provide electric energy to 220VAC electrical appliances, it is necessary to convert the DC energy generated by the solar power generation system into AC energy, so DC-AC inverter is required.



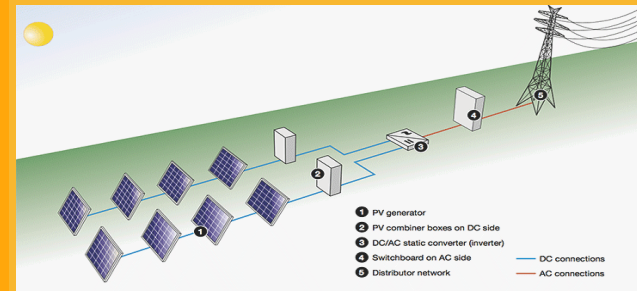
3: AC distribution cabinet

Its main function in the power station system is to switch the standby inverter, ensure the normal power supply of the system, and measure the electric energy of the line.

THE FORMS OF GRID-CONNECTED SOLAR PHOTOVOLTAIC GENERATION SYSTEM

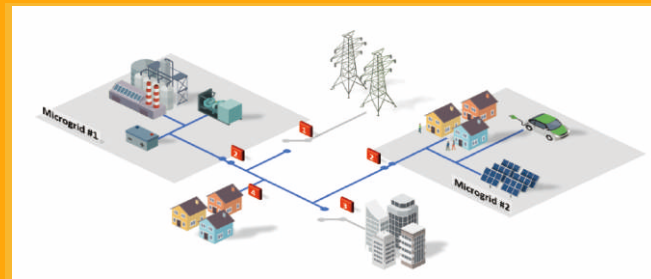
(1) Centralized grid connection

The utility model is characterized in that the generated energy is directly transmitted to the large power grid, which is uniformly allocated by the large power grid to supply power to users, and the power exchange with the large power grid is one-way. It is suitable for grid connection of large-scale photovoltaic power stations, which are usually far from the load point. Desert photovoltaic power stations are connected to the grid in this way.



(2) Decentralized grid connection

Also known as distributed photovoltaic power generation and grid connection, it is characterized in that the electric energy generated is directly distributed to the power load. The excess or insufficient power is regulated by connecting the large power grid, and the power exchange with the large power grid may be two-way. It is suitable for small-scale photovoltaic power generation system. Generally, this method is adopted for urban photovoltaic power generation system, especially for building combined photovoltaic system.



APPLICATION SCENARIOS

It is widely used in remote mountainous areas, power-free areas, islands, communication base stations and street lamps. The system is generally composed of photovoltaic array composed of solar cell modules, solar charge and discharge controller, grid connected inverter, DC load and AC load.

The photovoltaic array converts solar energy into electric energy when there is light, and supplies power to the load through the solar charge and discharge controller.



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