

Types of residential energy storage systems



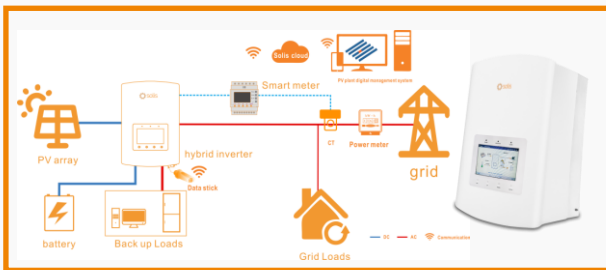
Background

The development of international energy storage is rapid, and is now widely adopted in the United States, Europe, Australia and other areas of the world. This is being driven by the continued increases in electricity prices as well as government policy support. Most energy storage systems are reflected in the application of residential solar + energy storage systems.

This Solis Seminar will focus on the different types and characteristics of common residential solar + energy storage systems.

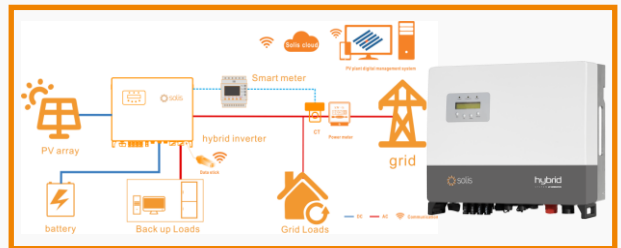
1 Hybrid Residential Solar + Energy Storage System

- **System Structure – Solis Single Phase**



A hybrid solar + energy storage system consists mainly of solar panels, batteries, hybrid inverter(s), grid-connected loads and back up (critical) loads. The system can directly charge the battery from the solar through DC-DC conversion and can also realize the bidirectional DC-AC conversion for charging and discharging of the battery.

- **System Structure – Solis Three Phase**



- **Working Logic**

During the day, the solar power is firstly supplied to the loads, followed by charging the battery. Any excess power after this can be fed into the grid. During the evening, the battery is discharged to supply the household loads, with additional power requirements supplemented by the grid. If the grid fails for any reason, the system will supply power to the connected critical loads. In addition, the system supports user defined charging and discharging time to meet the user's electricity demand or benefit from agile tariffs.

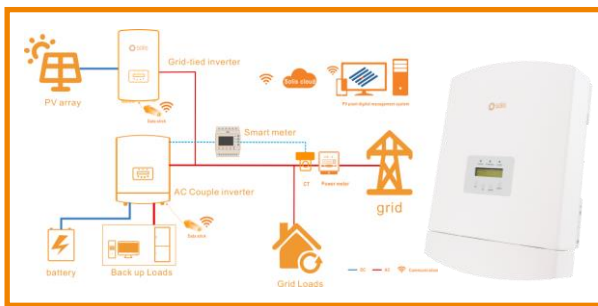


- **System Features**

- Simple and convenient installation.
- Intelligent control can be realized to meet the user's electricity demand
- Provides users with back-up power during power outages

2 AC Coupled Residential Solar + Energy Storage System

- **System Structure**



AC coupled solar + energy storage is the solution for any existing solar PV system looking to upgrade to energy storage. This system structure consists of mainly solar modules, existing grid-connected inverter(s), AC-coupled energy storage inverter(s), batteries, grid-connected loads and back-up (critical) loads. The system uses AC coupling to transform the basic grid-tied PV system through the AC side into an energy storage solution.

- **Working Logic**

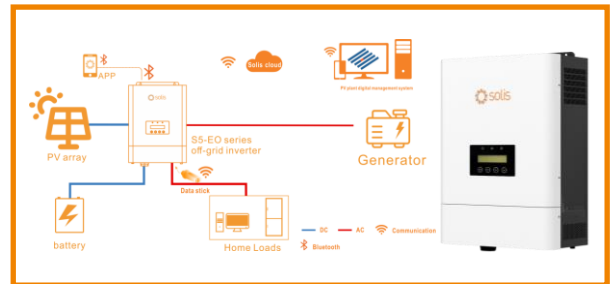
Its working logic is the same as that of the hybrid inverter. During the day, the solar power is first supplied to the load, followed by charging the battery, and finally the excess power can be fed into the grid. At night, the battery is discharged to supply loads, and any shortfall supplemented by the grid. If the grid fails, the battery will supply power to the critical loads. Again the system supports user defined charging and discharging times to match electricity demand or benefit from agile tariffs.

- **System Features**

- An existing grid-tied system can be upgrade into an energy storage system with very low investment
- Provides users with power protection during power cuts or grid failures
- Compatible with grid-connected solar inverters from different manufacturers
- Can support multiple units in parallel for system expansion

3 Off-Grid Residential Solar + Energy Storage System

- **System Structure**



This off-grid solar + energy storage system is mainly comprised of solar panels, batteries, off-grid energy storage inverter(s), loads and can also be connected diesel generators. This system will mainly be used in areas where the grid is unreliable or there is no power grid at all. The system can directly charge the battery from the solar through DC-DC conversion and can also realize bidirectional DC-AC conversion for charging and discharging of the battery.

- **Working Logic**

During the day, the solar power is firstly supplied to the loads, and secondly, the battery is charged. At night, the battery is discharged to supply the loads, and if additional power is required the diesel generator will supply the load.



- **System Features**

- Meets the daily electricity demand in areas without a power grid
- Can be combined with a diesel generator to supply the load or charge the battery
- Multiple units can be combined in parallel to form a large-capacity single-phase/three-phase energy storage power supply system.

Summary

Solis has a wide range of residential energy storage inverter products and can provide targeted solutions for each type of energy storage system depending on the needs of your area.

For the types of energy storage systems mentioned in the article, Solis products can support multiple parallel expansion which increases the capacity of the energy storage system to increase the load-carrying capacity.

For more information, visit the Solis website:

www.solisinverters.com