

One-Stop Renewable Energy Solutions from United Energy

Delivery Easy and Secure Turnkey Energy Solution





United Energy-15 Years Experience



2GWAnnual Production



10GW+
Modules Installed



150+
countries application



50+ Global Patner

2009

Found in 2009 (Silicon and Cell Trading Business)

2012

2016

First Solar Module Factory started mass production, 90% are POLY Modules

2020

Global Cumulative Module Shipment 2GW, 90% are MONO Modules

2023

Established warehouses in Rotterdam-Netherlands and Germany, also branch office in Czech Republic

2018

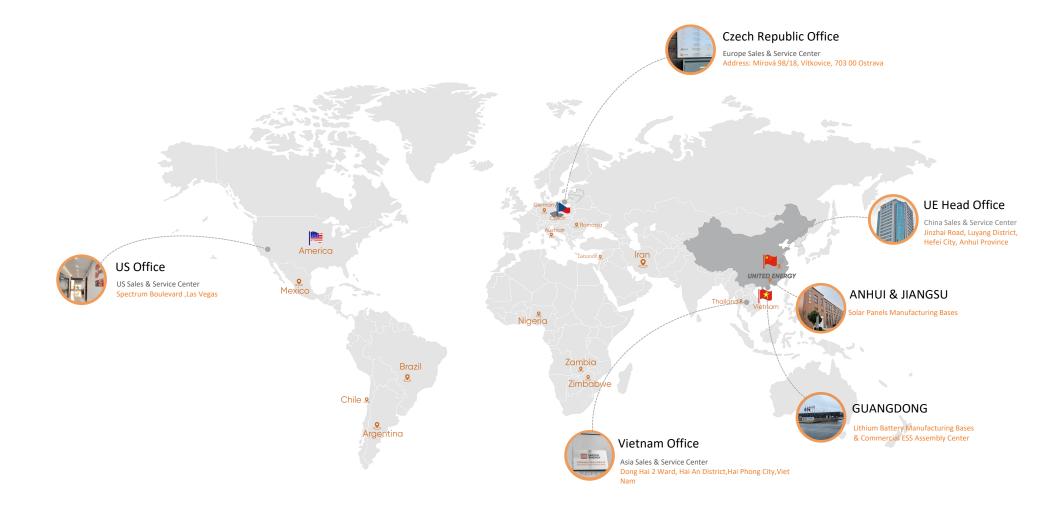
Start construction of production line for Silicon Material

Updated Production Line Annual Capacity 300MW,rewarded "High-tech Enterprise"

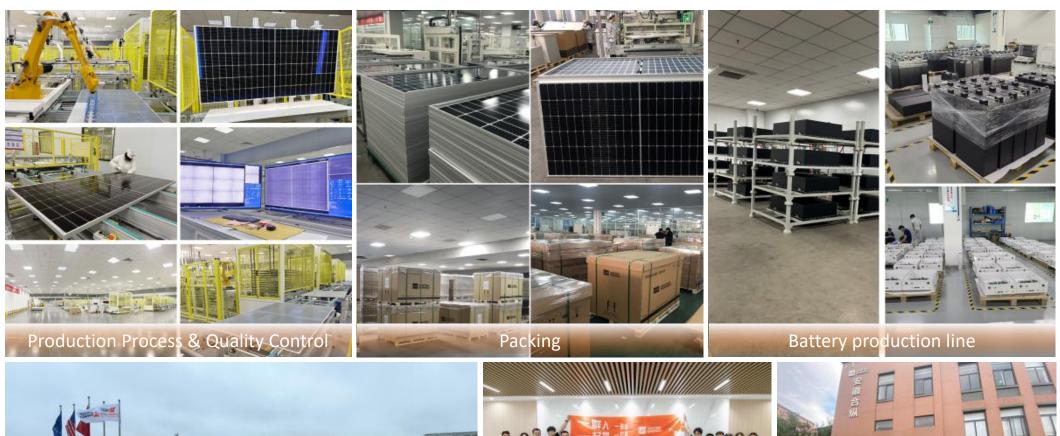
2022

Started Production of N Type Module Lithium battery factory put into operation R&D team for Commercial ESS solution created

Global footprints



Factories and UE team





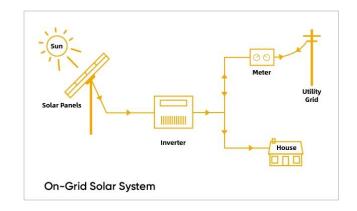


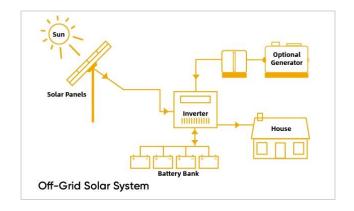


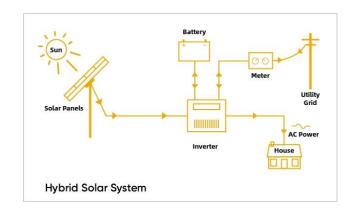


Our Energy Solutions and Products

Three scenarios: on-grid system, off-grid system, hybrid solar system; According to the scale, there are residential/commercial/utility scale system.

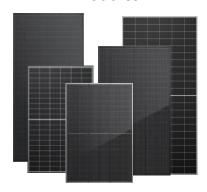






Main Products and Components in those system:

PV modules



HJT /Topcon /PERC Mono-facial /Bi-facial

Solar Inverter /PCS /Bi-directional inverter



On Grid /Off Grid /Hybrid

Battery



Lead Acid Battery, Lithium Battery

Accessories



Structures/Solar Pump/ Solar AC/
Cables/ Monitoring Devices, Breakers,
Connector, etc

Energy Solutions and Scenarios - Our Considerations

Our Principle



Safe and Security

Rapid-shutdown and anti-Arch system(especially for roof-top system);

high quality of batteries, extremely low risk of fire;



Effective and High Yield

Multi-Mppt to reduce the shadows; **Flexible work models** for higher revenue; (inject-grid first, Battery-first, maximum self-consumption;)



Simple, Easy O&M

Easy operation, free maintenance: Remote monitoring platform; easy configuration.
Full-Featured EMS: Easy to work in on-grid/off-grid/ hybrid model

Main System Size

Residential System (1kW-10kW, 5kWh - 50kWh)

Additional Key Points:

- 1. High Reliability: No fuse, No-fans;
- 2. Easy to installation: smaller size of PV modules

Commercial System (10kW - 500kW, 50kWh - 2MWh)

Additional Key Points:

- **1. High Reliability**: No fuse, first -class component in these main products:
- 2. Cost-Effective: Lower cost, High yield;

Utility Scale Project, Above 500kW/2MWh

Additional Key Points:

- 1. Grid-Friendly: The transformer/ the grid compliance;
- **2. Easy O&M:** Al diagnose PV string for massive PV string is very important;
- 3. Minimum LCOE: extremely cost-effective;

Energy Solutions and Scenarios - Panels

Extremely stable temperature coefficient

- -0.24%/°C for HJT Modules
- -0.32%/°C for TOPCon Modules
- -0.35%/°C for PERC Modules

Power attenuation of HJT is smaller, thereby reducing the loss of power generation

Higher Bifaciality

High bifaciality:

HJT modules is about 85%

5% higher than TOPCon modules.

15% higher than PERC modules

Higher power retention (lower attenuation rate)

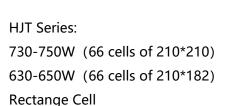
By the end of the 25th year, power attenuation for:

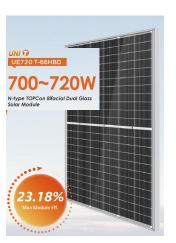
HJT: 92%

TOPCon: 89.4%

PERC: 87.2%













TOPCON Series:

700-720W (66 cells of 210*210) 595-615W (66 cells of 199*182) Rectange Cell **Topcon Series:**

580-600W (72 cells of 182*182) 430-450W (54 cells of 182*182)

Energy Solutions and Scenarios - Inverters (On-Grid Inverter)







Smart I-V Curve Diagnosis

1300/1600/1800/2000W micro inverter:

PV: 4 pieces of 210-600W

AC: 230V Single phase

Com: Power line/Wifi/Zigbee

EU model



3.6/4/4.6/5/6K inverter:

PV: 2Mppts, 70-500V/26A

AC: 220/230V Single phase

Com: RS485/RS232//Wifi/LAN

EU model



10/15/20/30/33/35/40/50/60kW Ongrid Inverters:

PV: 3Mppts, 4Mppts for 50/60K, 200V-

850V/80-160A;

AC: 220/380V, 230/400V Three phase

EU model



70/75/80/90/100/110kW On-grid Inverters:

PV: 6 Mppts, 6 inputs per Mppt, 200-

850V/240A

AC: 220/380V, 230/400V Three phase

EU model



185/216/250/253 kW On-grid

Inverters:

PV: 9/12/15 Mppts, 2 inputs per Mppt,

500-1500V/450-750A

AC: 800V Three phase

EU model

Energy Solutions and Scenarios - Inverters (Hybrid Inverter)



Multi-Mppt for higher yield



Support both On-Grid and Off-Grid models, support Export Limit Control



3.6/5/6K Hybrid Inverters:

Battery: 40-60V/ 90-135A, Lead -acid or

Li-lon;

PV: 2Mppts. 125V-500V/13-26A;

AC: 230Vac(single phase)

EU model



4/5/6K Hybrid Inverters:

Battery: 40-60V/ 60-100A, Lead -acid or

Li-lon;

PV: 2Mppts. 120V-450V/2*16A;

AC: 230Vac (single phase)

US/EU model



Multi-Mode: Battery first/ Grid first/ Load first.



8/10/12K Hybrid Inverters UL:

Battery: 40-60V/ 60-200A, Lead -acid

or Li-lon; PV: 2Mppts. 125V-450V/ 2*25A;

AC: 120/240V(Split phase); 208V(3

phase with 3 inverters in parallel);



29.9/30/35/40/50K Hybrid Inverters:

Battery: 160-800V/ 50+50A, Li-lon

PV: 3/4Mppts. 150V-850V/108-144A; AC: 220/380, 230/400Vac Three phase

EU model

Energy Solutions and Scenarios - Inverters (Battery Inverter)



HPS, 30/50/100/120/150 (EU, US)

Max 4 in paralleL

PV Input: 1 , Voltage: 480-800V

• **Battery input**: 1, 352-600V

• Charge and discharge current: 93/156/313/374/467A

- AC Grid and Load: 3-Phase 380V (eu) / 220V Delta with Spilt Phase(us)
- · Build in Transformer
- ATS is necessary when grid & generator are both exist



ATS 30/50/100/150

 3 Input: HPS, Grid, Diesel Generator. (100/250/400/630A)

 Contains lightning protection and monitoring, built-in contactor;



PCS, 100/250/500/630/1000 (EU, US)

DC Battery Input:

100kW/250kW: 500-820V 500kW/630kW: 600-900V

1000kW: 700-900V

Charge and discharge current: 220A/550A/917A/1155A/1430A

- AC : AC Grid and Load: 3-Phase 380V

 (eu) / 220V Delta with Spilt Phase(us)
- 100/250KW Build in Transformer
- 500/630/1000 Without Transformer
- BYPASS is necessary when grid & generator are both exist



By-Pass, 100/250/500/630/1000 (EU, US)

- Breaker: PV Inverter, PCS, Grid, Load,
 By-pass, Diesel Generator.
 (250/630/1250/1250/2000A)
- With SPD INSIDE



PBD 250

PV input: 50kw / MPPTMPPT Range: 350-850v

Two DC output ports: Batter and PCS



Enerlog data logger

Supports backflow prevention
Supports access to 32 inverters
Uses RS 485 communication

Energy Solutions and Scenarios - Energy Storage System(Batteries)





Low Voltage Batteries
5/10kWh Li-lon Batteries:

48/51.2Vdc, 100/200Ah; Max charge/discharge current: 100A 15 Years Lifetime, 6000 cycles



GEL Batteries

2V, 500/800/1000/1500/2000/2500/3000Ah; 3000 cycles@50%DOD, 10-15 years Lifetime; **12V, 100/150/200/250Ah;**

3000 cycles@50%DOD, 10-15 Years Lifetime;



Rack-Type

High Voltage Batteries 19.2/38.4...211kWh Li-lon Batteries:

192/384/480/672/768Vdc, 100/200/300Ah; 15 Years Lifetime, 6000 cycles



ESS container system (LiFePO4)

50-500kW/ 500-10,000kWH

0.5C/1C

Cells: 3.2V, 280Ah/306Ah/314AH

6000 Cycles (0.5C, 25°C, 80% EOL)

Include three levels control system

Include the PCS(power conversion system)

EMS(Energy Management System)

Liquid/Air Cooling

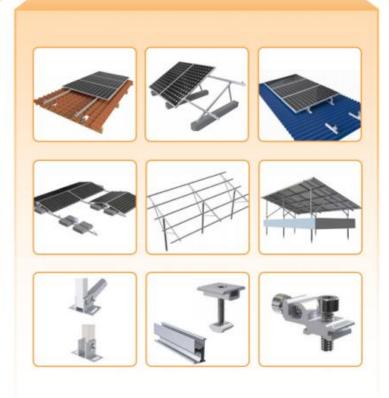
Energy Solutions and Scenarios - Accessories

Transformers, Switch Gears, DC/AC Cabinets, DC/AC Cables etc

Mounting System for different Scenarios

Monitoring Platform and data logger, Meters.









Advantages - One-Stop Energy Solution Provider



Cost-Effective

Cost-effective PV modules and batteries at lower manufacturing cost;

Professional

A professional team for the whole solutions, the layout/ electrical design/ monitoring solutions;

03

Localized Service

We provide the local service for whole EU area, Vietnam.

04

Sourcing Expert

We have a deep understanding of solar/ energy market, we know all good suppliers and manufacturers in China, and how to choose the best products and solution for you.

Step 1: Requirements
Analysis, to confirm the solution design.

Step 3: Detailed Design

(Layout, Electric Diagram, Network/monitoring design)

Step 5: Training Service - Remote or onsite support for installation&Commissioning

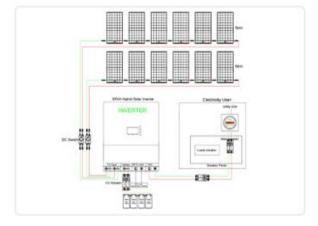
Step 6: Installation guidance and After-Sales Service

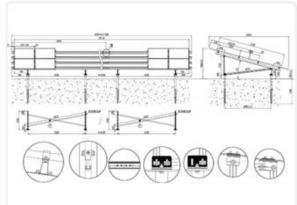
Step 2: compare and confirm the detailed BOM and Cost

Step 4: Manufacture and Delivery

Advantages - Professional design

Mounting System







Annual Power Generation Simulation



3D Renderings

Electrical Diagram

Certificate





















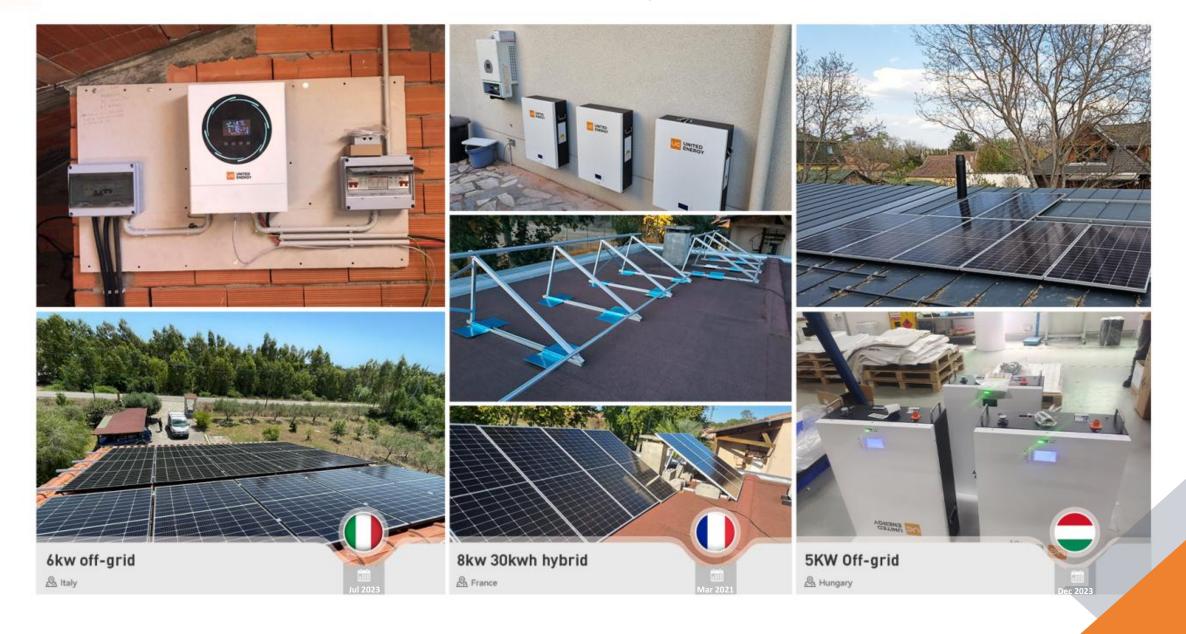




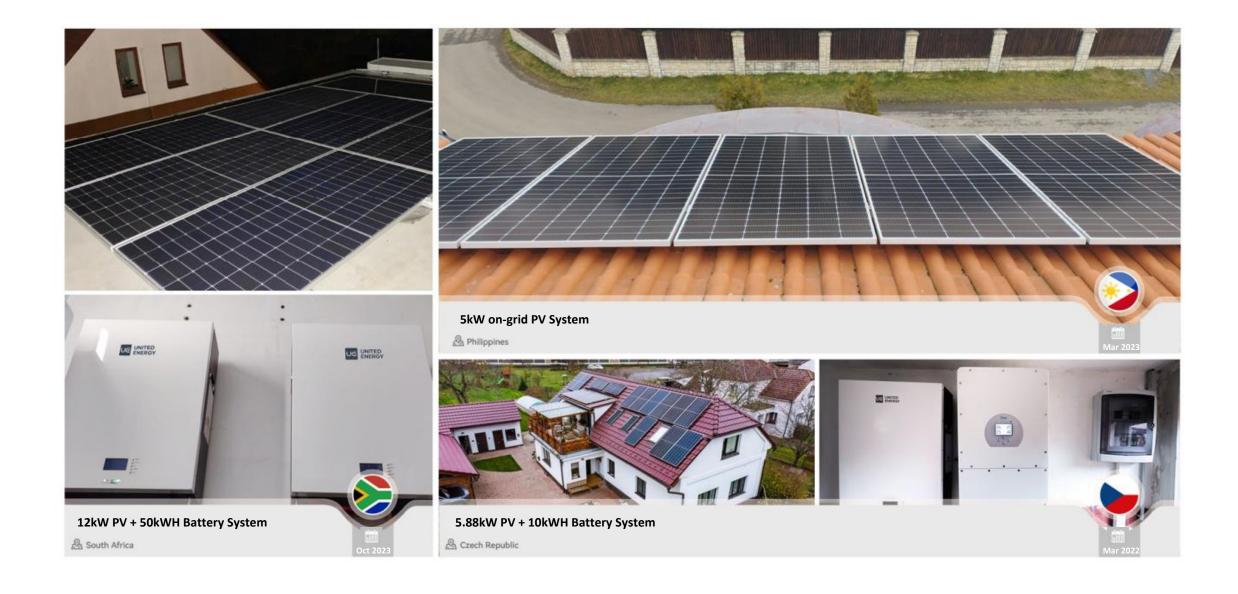




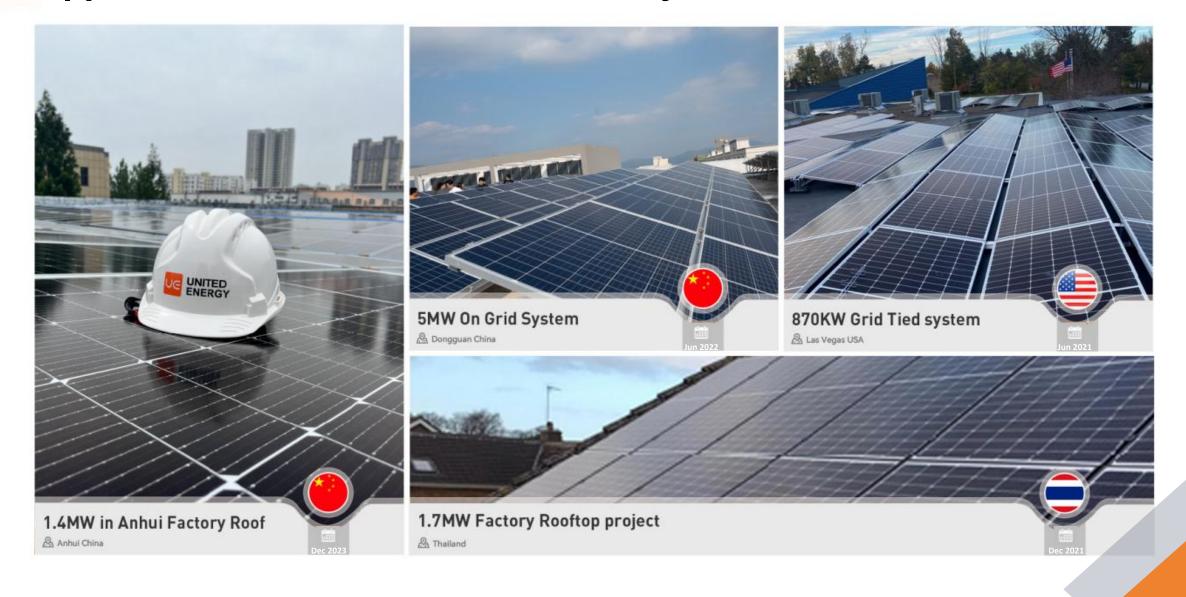
Applications and Cases - Residential System



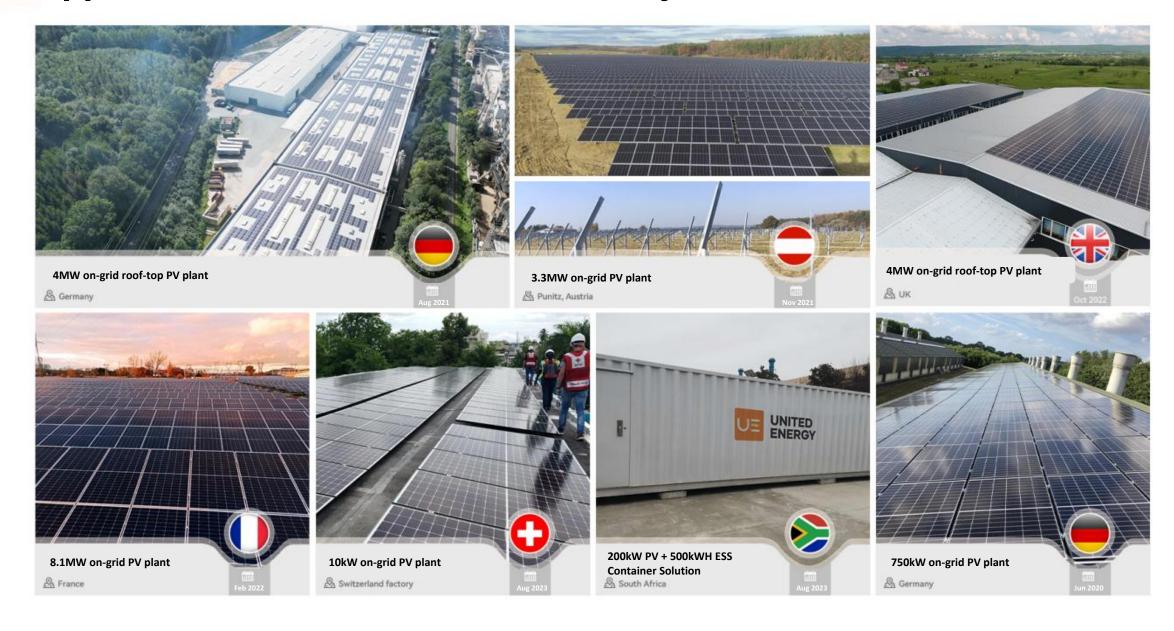
Applications and Cases - Residential System



Applications and Cases - Commercial System



Applications and Cases - Commercial System



Applications and Cases - ESS System













May 2021

665.6V 280AH * 8 clusters = 1.49MWH

PCS 500KW *2 units



A Xuanwu District, Nanjing City, Jiangsu Province



Thank You for your attention!

