


Hunan Red Solar New Energy Science and Technology Co., Ltd.

REDSOLAR

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# 01

## COMPANY OVERVIEW

# REDSOLAR

State-owned, high-tech backbone enterprise incubated by the national-level semiconductor equipment research institute (CETC-the 48th Research Institute)

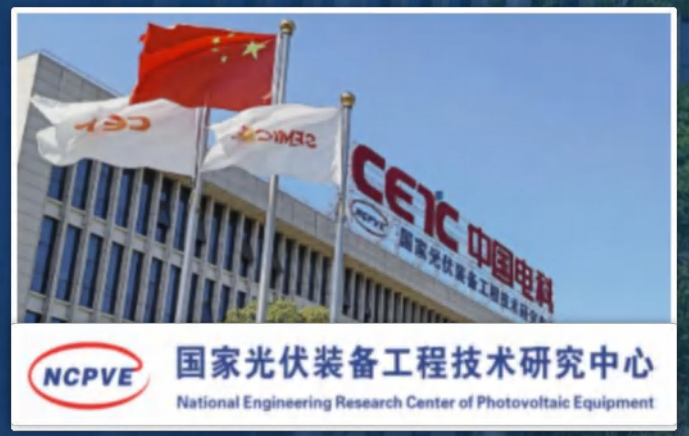
FORTUNE 500 in the 2024 CETC (Ranked 253rd)

| Founded | Registered Capital | Employee | Revenue | Core Patents |
|---|---|---|---|---|
| 2008 | USD 50 Million | 1000+ | USD 275 Million | 100+ |

## Two National Key Research Platforms




China-Egypt Renewable Energy Joint Laboratory




National Engineering Research Center of Photovoltaic Equipment

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# Milestones



**1964**

**Tech DNA**

Previous holding company CETC 48th Institute was established

**2008**

**Born to Meet the Trend**

Establishment of Red Solar

**2010**

**Leading in Scale**

1.5GW vertically integrated PV full industry chain established

**2013**

**Strategic Transformation**

Starting Power Plant Investment & 500MW Power Plant Developed

**2017**

**Intelligent Manufacturing**

National Engineering Research Center of Photovoltaic Equipment has been established

**2019**

**International Benchmark**

World's First Photovoltaic Full Industry Chain Turnkey Project Completed in Turkey

**2022**

**Global Breakthrough**

Ranked among Top 20 global PV manufacturers
Overseas business share exceeded 40%

**2025**

**Revolution**

Expand overseas power plant investment business

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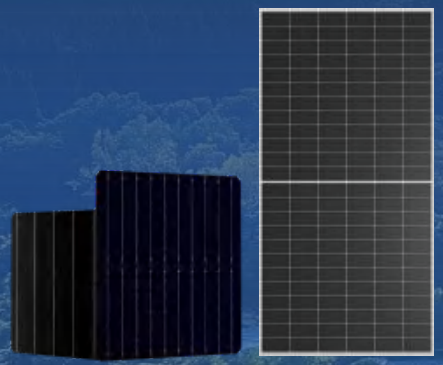
# Main Business

## PV PRODUCTS



## PV SYSTEM SOLUTIONS



## TURNKEY SOLUTIONS



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# Based in China Expanding Globally




R&D and Manufacturing Bases
**3**

Overseas Channels
**20+**

Countries Covered
**50+**

Total PV Products Delivered Worldwide
**40GW+**

Hunan (Changsha): Headquarters, Operations & R&D Center



Guangdong: Intelligent Manufacturing & Delivery Center



Jiangsu: Intelligent Manufacturing & Delivery Center



# 02

## PV PRODUCTS

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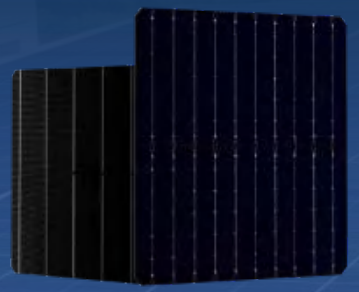
# Product Matrix

## Cells



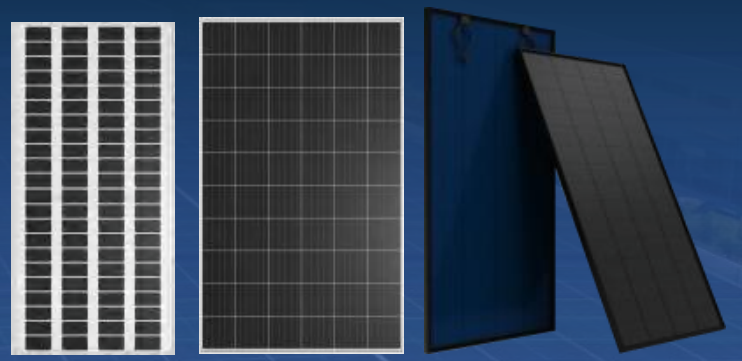
**5 GW**
M2-G12

## Standard Modules



**5.5 GW**
Max. 720W

## Customized Modules



**2 GW**
Customization of size, power, color etc.

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# Core Comptetence

## Manufacturing Strength

- A fully customizable cell R&D & mass production platform for all sizes



- 5.5GW Stable PV Product Supply Capacity



- Professional and reliable testing experimental platform



## High Quality Talent Strength

**15+**
PhD Researchers

**68+**
Senior Engineers

**288+**
Engineers

## Product Warranty

30 year
Product Warranty

30 year
Power Warranty

## Certification

TÜV NORD

JPEA

MCS CERTIFIED

CLEAN ENERGY COUNCIL

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# Standard Modules

## Residential



G12R TOPCon 455W



## Utility



G12 TOPCon 720W



## Commercial & Industrial



M10 TOPCon 595W
G12R TOPCon 625W
M10 TOPCon 640W





# Standard Module Cases

## China


Inner Mongolia, China 180 MW


Chongqing, China 82 MW


Hainan, China 89 MW


Yunnan, China 32 MW

## Asia-Pacific


Jeolla-do, South Korea 1 MW


Jeju Island, South Korea 1.9 MW


Gangwon-do, South Korea 5 MW


Miyazaki Prefecture, Japan 45 MW

## Others


Germany 8.9 KW


Italy 1 MW


Chile 9.4 MW


Morocco 36 MW

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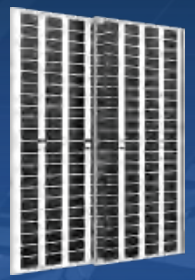
# Customized Modules

## Agriculture



Power: 100-500W
**Transparent Encapsulation & Large Cell Spacing**
**Light Transmittance10-60%**



## Villa Roof



Power: 320-330W
**All-Black**
**Module Area < 1.5㎡, Easier Installation**



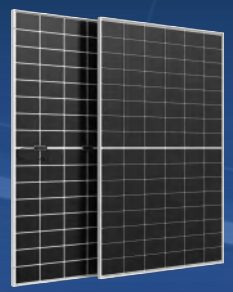
## Repowering



Power: 310-400W
**Classic Model: G12 330W**
**Keep Old Bracket**
**Reduce Repowering costs**



## Low Load-Bearing



Power: 430-450W
**40% Reduction in Module Weight**
**Suitable for Low Load-Bearing Scenarios of 7 kg/㎡**



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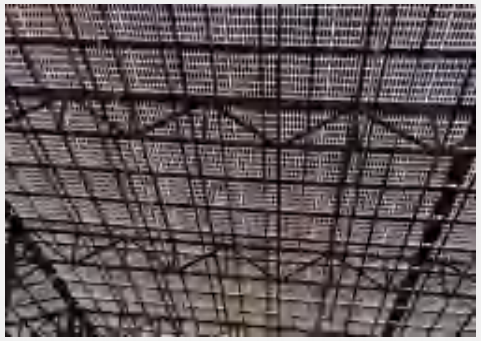
# Customized Module Cases

## Agri-PV & Warehouses



China 20 MW



China 6 MW

## Repowering



Japan 2.4 MW



Denmark 2 MW

## Low Load-baring



South Korea 3.2 MW



China 3.5 MW

## Villa Roof



UK 3 KW



Germany 10.9 KW



# 03

## PV SYSTEM SOLUTIONS

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# Power Plant Solutions for Mainstream Scenarios

## Microgrid Solutions



## Commercial & Industrial Solutions



## Utility Solutions



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# End-to-End Full Process Solution

## F

- Investment
- JV Development
- BT/BOT

## EPC


Factory Roof


Commercial Building


Warehouse & Logistics


Transportation Scenarios


Data Center


Public Facilities


5G Base Station


Zero-Carbon Park

## O&M

- Intelligent O&M
- Repowering
- Electricity Trading

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# Core Advantages

## Strong R&D team

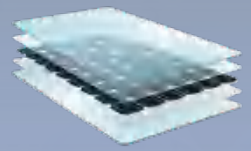
National Key Research Platform + 60 Years of Semiconductor Equipment Technology Experiences + Over a Hundred Independent Intellectual Properties






## Efficient & Reliable Products

Self-Developed and Self-Produced Modules + 300 Industry Strategic Partners, with Quality and Price Advantages




HUAWEI BYD CATL Deye

## Professional Design & Construction Qualifications

Design Qualification + Top-Level Power Construction Qualification





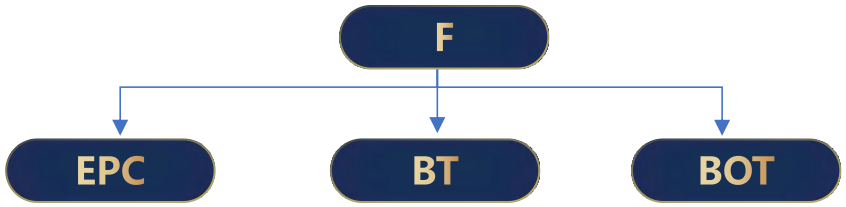

## Full-Cycle Service Guarantee

Pre-project Technical Consultation, Construction Guidance, Intelligent O&M + Global 24/7 Service Network




# Investment & Financing Services

## Three Flexible Cooperation Models




- Self-owned Capital: Over 1 Billion RMB Project Capital Safeguard Capacity

Strategic partnerships with 7 banks/financial institutions

Financial Empowerment

Securing over CNY3 billion in Green financial credit lines

## Three Financing Scenarios



Mining Sites



Industrial Parks



Transport Facilities

PICC 中国人民保险

SINO SURE 中国出口信用保险公司 CHINA EXPORT & CREDIT INSURANCE CORPORATION

中非发展基金 CHINA-AFRICA DEVELOPMENT FUND

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# Partners & Customers



## Microgrid Case:
## Nigeria Public Building Project (EPC)

**7.66 MW PV System + 40 MWh Energy Storage System**
**Annual Power Generation: 12.5 Million kWh**
**Explosion-Proof Electrical Equipment & Multi-Layer Fire Isolation System**
**Ensuring Safe and Stable Power Supply for the Park**

- Ensures 24/7 uninterrupted power for the park even during continuous rainy weather, ensuring zero outages.
- Saves clients USD 1.07 million annually.
- Ultimate fire, explosion, and lightning protection for the critical hub in Africa's largest economy.

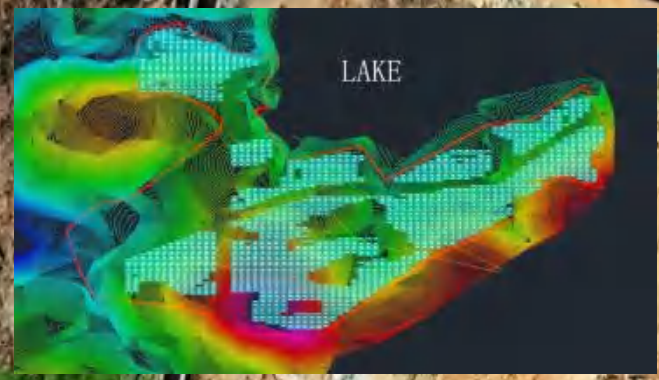


| Power station capacity | Number of modules | Energy storage capacity | Annual average Energy output |
|---|---|---|---|
| 7.66MWp | 12164 | 40MWh | 12.5 million KWh |

## Microgrid Case:
## Zimbabwe Lithium Mine Project (BOT)

**36 MW PV System + 45 MWh Energy Storage System**
**Annual Power Generation: 66.57 Million kWh**
**Reduce emissions and save energy, advancing the clean energy transition for mining clients.**

- A customized design solution ensures clients use 100% renewable green power daily from 7:00 AM to 9:00 PM.
- Annual electricity cost savings: USD 6 million; static payback period of only 4.2 years.
- Optimize energy storage allocation to stabilize photovoltaic fluctuations and enhance power supply stability, while considering peak-valley arbitrage.




| Power station capacity | Number of modules | Energy storage capacity | Annual average Energy output |
|---|---|---|---|
| 36MWp | 58072 | 45MWh | 66.57 million KWh |

## C&I Case:
## Lens Technology BIPV Photovoltaic Project (EPC+F)

### BIPV Customized Solutions
### Ensuring High Returns During the Power Plant's 25-Year Lifecycle

- Central and South China's largest installed capacity and Hunan Province's largest single-roof BIPV project.
- Customized color steel tile BIPV with continuous drainage channels up to 12 meters in length.
- Power generation and waterproofing, ensuring a 25-year project lifespan.
- Provides efficient financing services, product supply, and power plant maintenance services.



| Power station capacity | Number of modules | Roof type | Annual average Energy output |
|---|---|---|---|
| 76.12MWp | 133559 | Color Steel Tile, Concrete | 70.58 million kWh |

# C&I Case:
# Zhuzhou BAIC Phase II 24 MW Distributed Project (EPC)

## Strong Financial Support

## Rapid Project Implementation for Clients

- Self-produced and self-consumed, with Red Solar providing over 100 million yuan in funding to support project construction.
- As the largest photovoltaic carport in Zhuzhou City, Hunan Province, it shelters 5,000 vehicles from wind and rain while generating electricity.
- Annual power generation: 11.6283 million kWh, with a stable return rate exceeding 9% and a payback period of 9 years.

| Power station capacity | Number of modules | Roof type | Annual average Energy output |
|---|---|---|---|
| 24MWp | 27298 | Carport | 11.63 million kWh |



# Ground-mounted Power Plant Case: Milyang City, South Korea 1 MW Power Plant Project (BT)

## Red Solar's Self-Invested Power Plant in South Korea Officially Put into Operation Driving the Company's Global Strategic Development

- 1 MW photovoltaic system generates 1.3759 million kWh of electricity annually.
- Long-term stable returns: The project's all-internal rate of return (IRR) is 10.5%, with a payback period of 8.2 years.
- Controllable risks: Full control over project quality and costs, with independent management across the entire process from investment and design to construction.



| Power station capacity | Number of modules | Roof type | Annual average Energy output |
|---|---|---|---|
| 1MW | 1717 | Ground | 1.3759 million kWh |

# Ground-Mounted Power Plant Case: Hangjin Banner, Inner Mongolia Photovoltaic Project

## Innovative Design, Efficient Delivery
## Smart O&M Forges a Photovoltaic Giant in the Desert

- Innovative Hybrid Mounting System: Inverters and other major components are configured according to local conditions.
- N/P-type Module Comparative Verification: Bifacial Double-Glass Modules Boost Efficiency by 10%.
- 8.54 Million Squre meters of Super PV Project in Desert: Illuminating 5,500 Acres of Desert Oasis.
- Unmanned Operation, Minimal Supervision, Integrated Dispatch Platform, Supplemented by IV/CV Precision Fault Detection.

| Power station capacity | Number of modules | Project area | Annual average Energy output |
|---|---|---|---|
| 200MW | 370370 | 5,500 acres | 155.6 million kWh |





04

## TURNKEY SOLUTIONS

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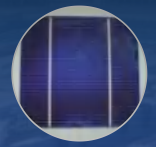
# Full Industry Chain Turnkey Solutions

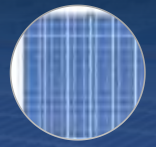
## Complete PV Industry Chain

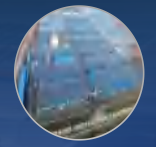

Silicon


Silicon rod


Silicon wafer


Cell


Moudle


Power station

## Providing design, equipment, engineering and services covering full photovoltaic industry chain

### Design

Conceptual Design
Basic Design
Detailed Design

### Products

Equipment Integration
Raw Material Supply
Spare Parts & Consumables
Services

### Construction

Peripheral Construction
Equipment Commissioning
Capacity Ramp-up

### Operations & Maintenance

Production Management
Equipment Maintenance
Quality Control

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# End-to-End Solutions

## 1 • Project Design



Comprehensive industrial chain park planning, factory design, and production line design services

## 2 • Equipment Integration



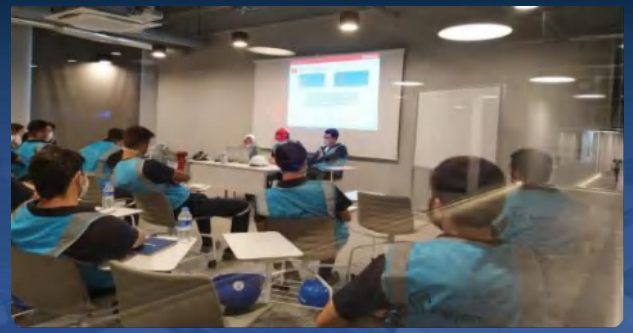
Stable all-round suppliers and partners with first-class integrated industry equipment

## 3 • Capacity Ramp-up



Specialized capacity ramp-up services, helping clients to rapidly realize industrial value

## 4 • Diverse Training



Diversified training system, combining video and practical instruction to shorten operators' training period

## 5 • Supply Chain Services



Mature supply chain system, shortening procurement cycles, enhancing product quality, and reducing procurement costs

## 6 • Production Line Operations



Full-process manufacturing line operation services, ensuring capacity and yield targets

# Strenghs & Advantages

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## Hard Power

- 3 Research Bases
- National-Level R&D Platform
- International Joint Laboratory

## Soft Power

- Rich Operational Experience
- Supply Chain Assurance
- Localized Services

## Achievements

**25+**
Global Strategic Clients

**20+**
Successfully Delivered Production Lines

**15GW+**
Cumulative Construction Capacity

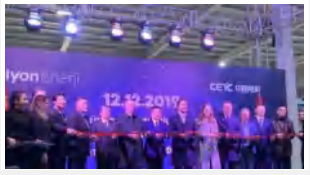
# Turkey One-Stop "Turnkey" Photovoltaic Project

## World's First (Outside China) Integrated Photovoltaic Industry Chain Factory

- 2GW Module Manufacturing Production Line "Turnkey" Project
- Monocrystalline Ingot Pulling, Wafer Slicing, Cell & Module Production– Complete Photovoltaic Industry Chain
- 500MW (Phase I) Production Line Project Delivered in a Lightning-Fast 10 Months
- Securing 1GW Power Plant Quota Through Successful Localized Production Line Construction



October 2019: Diaoyutai Signing Ceremony



December 2019: Project Commencement



May 2020: Chartered Flight to Turkey



June 2020: First Module Offline



July 2020: First Monocrystalline Ingot Offline



August 2020: President Erdoğan Inspects First Solar Cell Offline

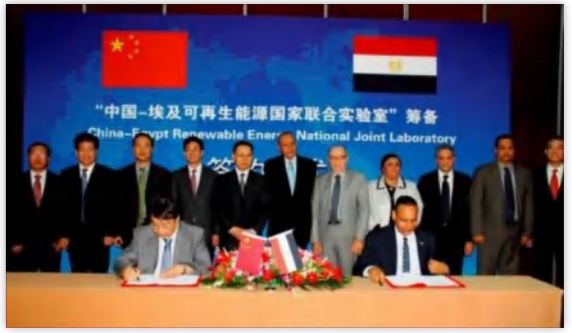
# Production Line Case – China-Egypt Joint Research Laboratory

## Cooperation Achievements

- Egypt's First Photovoltaic Manufacturing Pilot Center
- Egyptian Photovoltaic Product Standards Laboratory
- Foundation for Egypt's Photovoltaic Industry

## Future Planning

- Laboratory Phase II Expansion
- Egypt GW-Scale Photovoltaic Industrial Park Planning




August 2015: Project Contract Signed

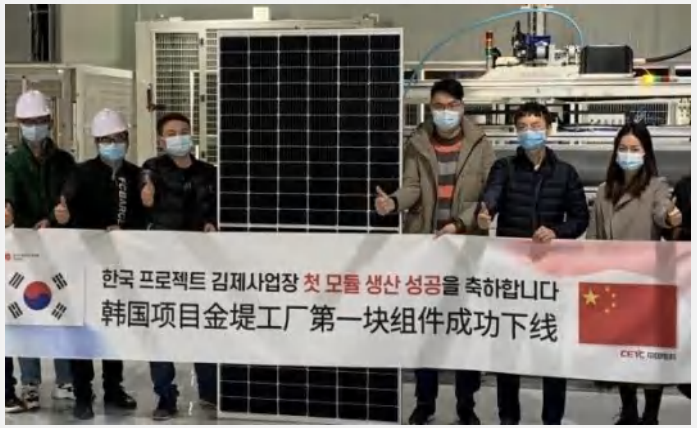


March 2016: Project Construction Commenced



Early 2017: Project Completed

# Turnkey Solution Cases




South Korea 600 MW Module Production Line EPC Turnkey Project



Turkey 500 MW Module + Peripheral EPC Turnkey Project



Turkey 500 MW Module EPC Turnkey Project




India 500 MW Cell Production Line Project




Nigeria 600 MW Module EPC Turnkey Project



Turkey 1 GWh Energy Storage Lithium Battery Pack Line EPC Turnkey Project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WHERE THERE IS LIGHT, THERE IS REDSOLAR
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