



DONGFANG ELECTRIC CORPORATION

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DEC Overview





- Foundation: Since 1958
- Main business: Power equipment manufacturing and EPC Contracting Service
- China national R&D Center for machinery manufacturing
- Listed enterprise in HKSE(Code: 1072) and Shanghai Stock Exchange (Code: 600875)

DEC In Data

(2017)

Revenue:

4.7

Billion USD

Orders in hand:

13.1

Billion USD

Total assets:

15.8

Billion USD

ENR Ranking:

107

Annual Capacity:

30.7

GW

Overseas Capacity:

84⁺

GW

Total Capacity:

500⁺

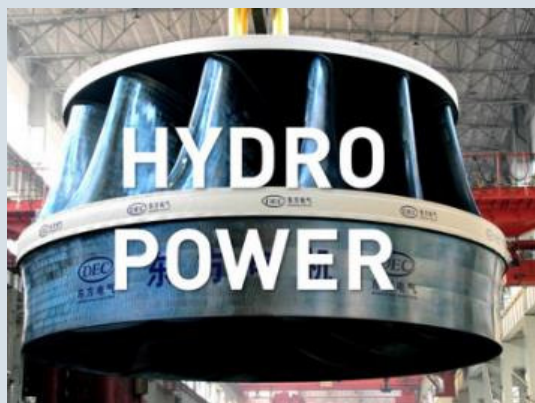
GW

Employees:

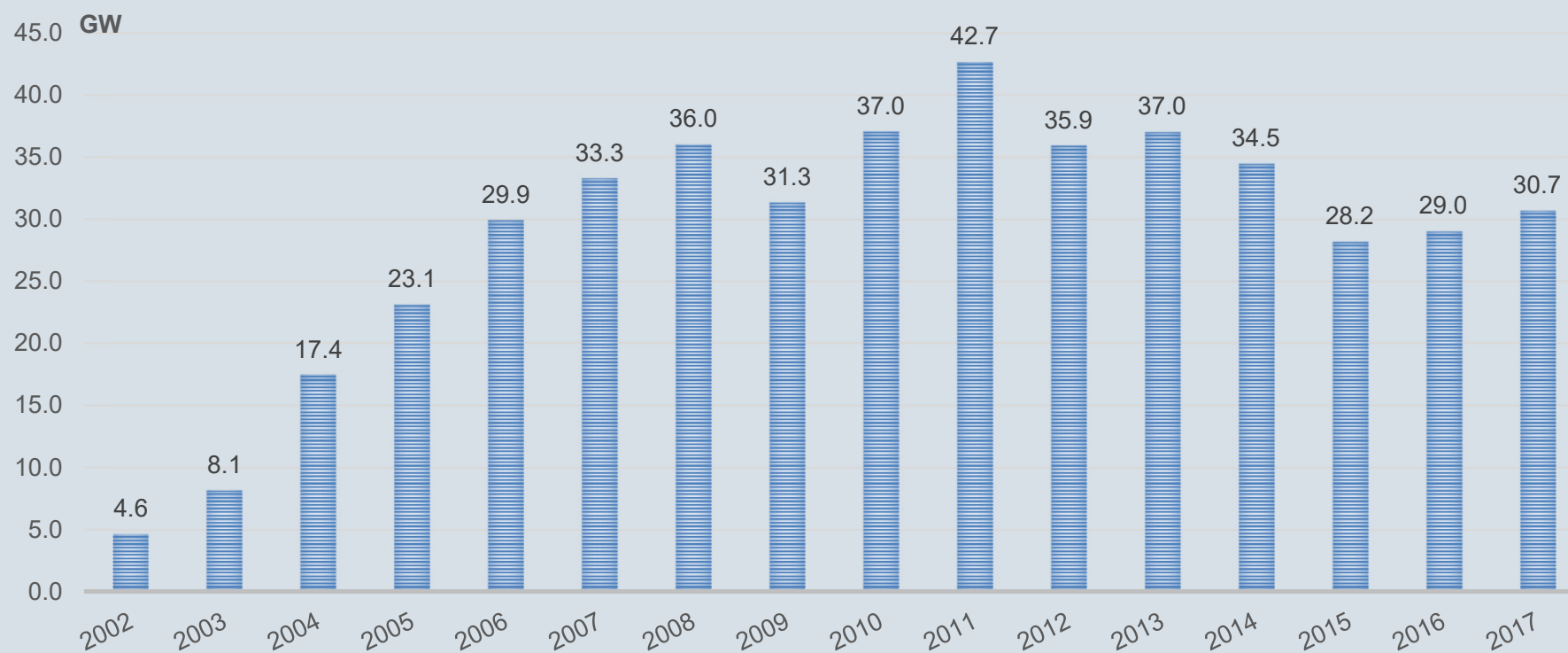
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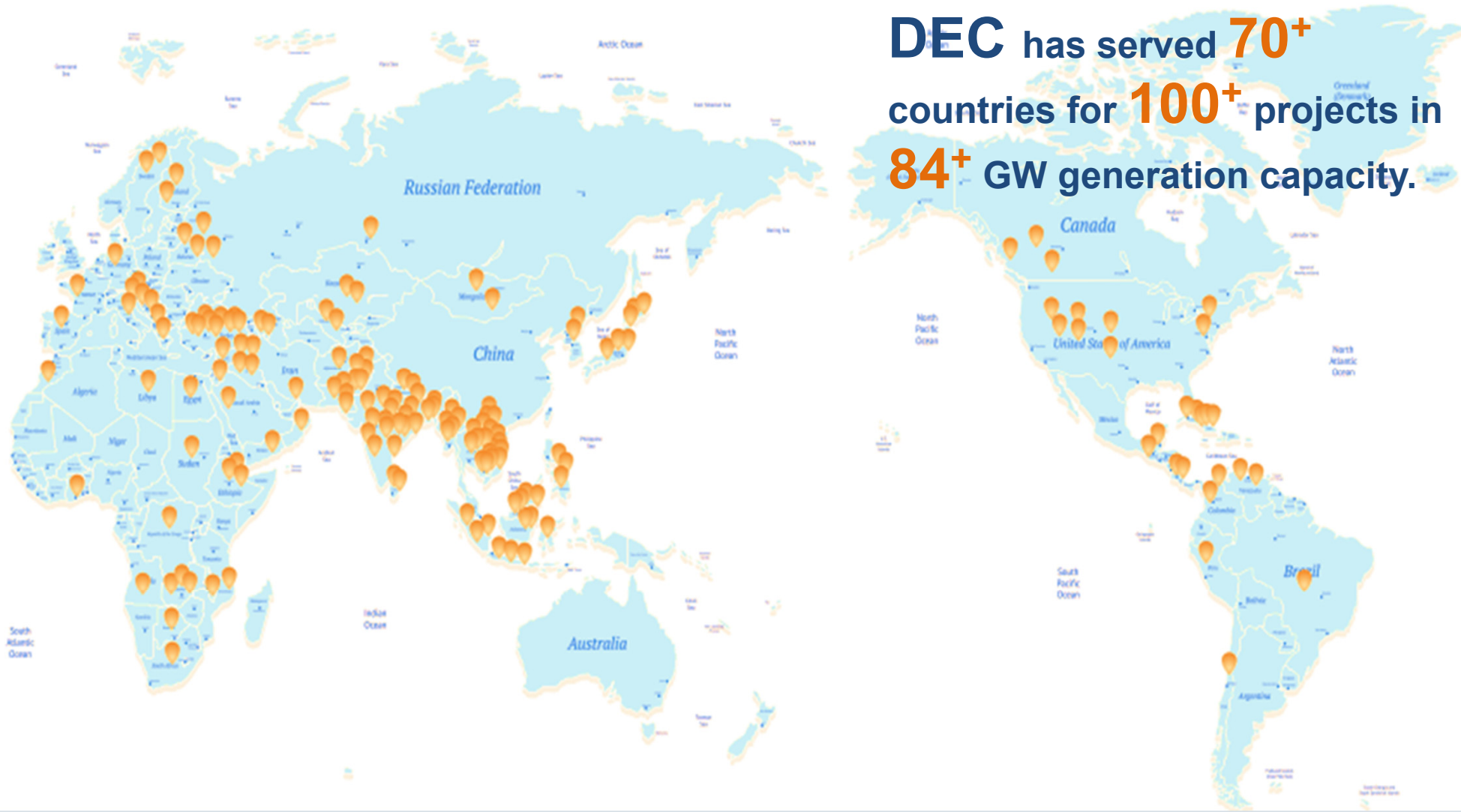
中国东方电气集团有限公司



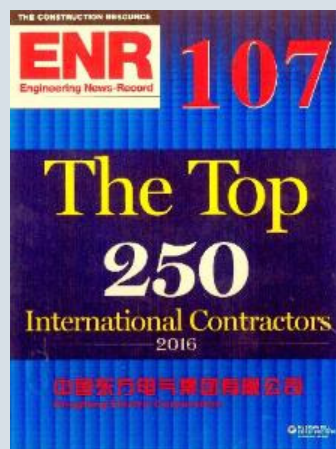
Annual Delivery World Largest Continuously



Global
Footprints



DEC has served **70+**
countries for **100+** projects in
84+ GW generation capacity.



ENR Top 250
International Contractors



ENR Top 80
Chinese Contractors



ISO 9001



ISO 14001



ISO 18001

INTEGRATED ENERGY SERVICES PROVIDER



Engineering

- Survey
- Design
- consulting
- supervision

Manufacturing

- Power equipment manufacturing

Contracting

- EPC
- Equipment Supply

Financing

- Project financing
- ECA financing
- Export Credit
- Equity Investment

O&M

- O&M service
- Spare parts
- Training
- Overhauling and rehabilitation



Project Financing
(incl. BOT/BOO)



Structured
Trade Financing



Export Credit
Gibe III Project
Ethiopia



Export Credit
Hai Phong Power
Vietnam



ECAMCA Financing



Equity Investment



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



国家开发银行
CHINA DEVELOPMENT BANK



中国进出口银行
THE EXPORT-IMPORT BANK OF CHINA



中国工商银行
INDUSTRIAL AND COMMERCIAL BANK OF CHINA



中国银行
BANK OF CHINA



中国建设银行
China Construction Bank



SOCIETE
GENERALE



BNP PARIBAS



东方电气
DONGFANG ELECTRIC

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DEC

Solar Business

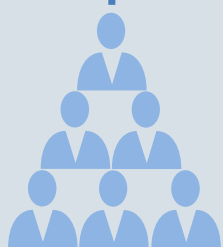


东方电气
DONGFANG ELECTRIC

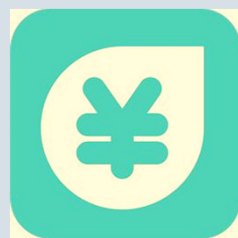


“东方环晟” or “DZS Solar”

东方环晟光伏(江苏)有限公司
Dongfang Huansheng Photovoltaic (Jiangsu) Co., Ltd



Establish
August, 2015



Capital
USD160m



Solar cell production
1.2GW/a, conversion
efficiency $\geq 21.5\%$

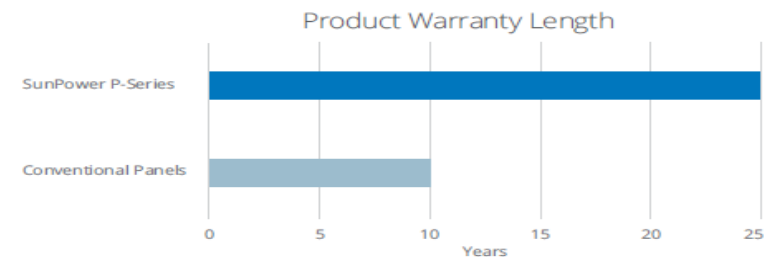


Solar modular
production 5GW/a,
conversion efficiency
 $\geq 19\%$

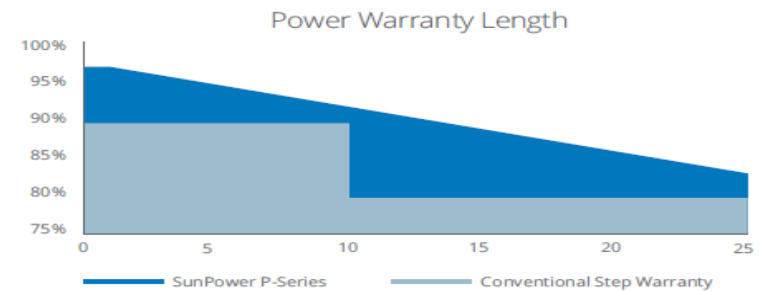
SunPower® Performance Series 1500 Volt | P19

- Increased Energy Production
- Higher Efficiency- up to 19.6%
- Optimized for the Oasis® Power Plant
- High Reliability
- SunPower Quality
- Monocrystalline Cell
- Nominal Power: 385W~405W
- Better Performance Under Shade: ~40% higher than Conventional Panels
- Temperature: -40°C to $+85^{\circ}\text{C}$

25 Year Combined Warranty Protect your investment

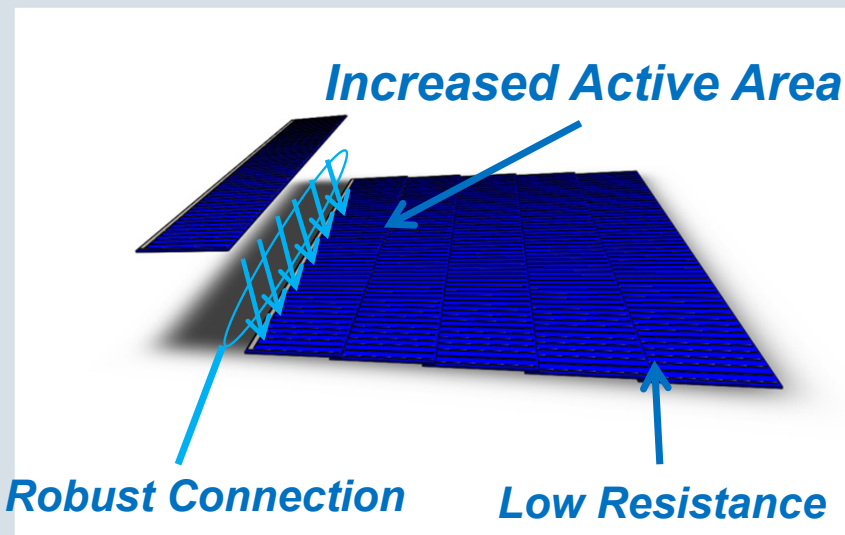


SunPower provides the best 25 year Combined Power and Product warranty in the industry, providing coverage regardless of product defect or power loss.



SunPower's Performance Series is warranted to produce more than 97% power in the first year, then declining by 0.6% per year, ending at 82.6% power after 25 years.

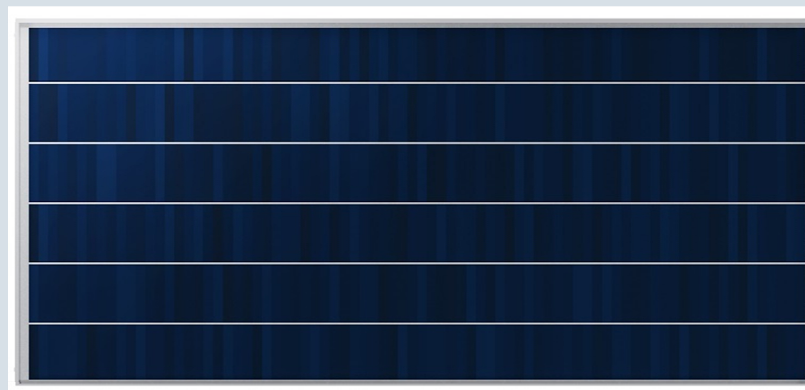
SunPower® Performance Series 1500 Volt | P19



Shingled cells provide flexible and redundant electrical connections



**Frameless
Dual Glass
Mono-PERC
400 W
Up to 19.6% eff.**

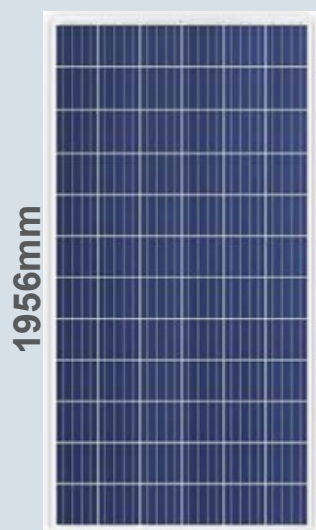


**Framed
Multicrystalline
350 W
17.1% eff.**

SunPower® Performance Series 1500 Volt | P19

Turning Standard Cells into Superior Modules

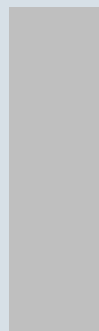
Conventional Panel
Efficiency: 16%



1956mm

992mm

310W



**Efficiency:
7% higher**

+3%

Reduced
Electrical
Resistance

+4%

More light
absorption
: no
reflective
copper
lines and
less white
space

+6%

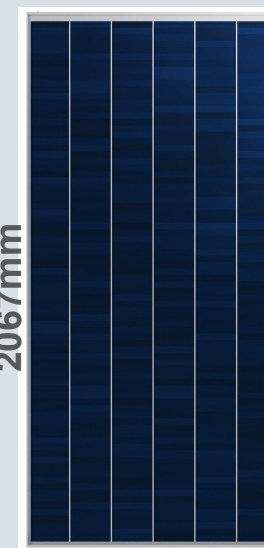


Larger
area

350W



P-Series Shingled-cell Panel
Efficiency: 17%



2067mm

998mm

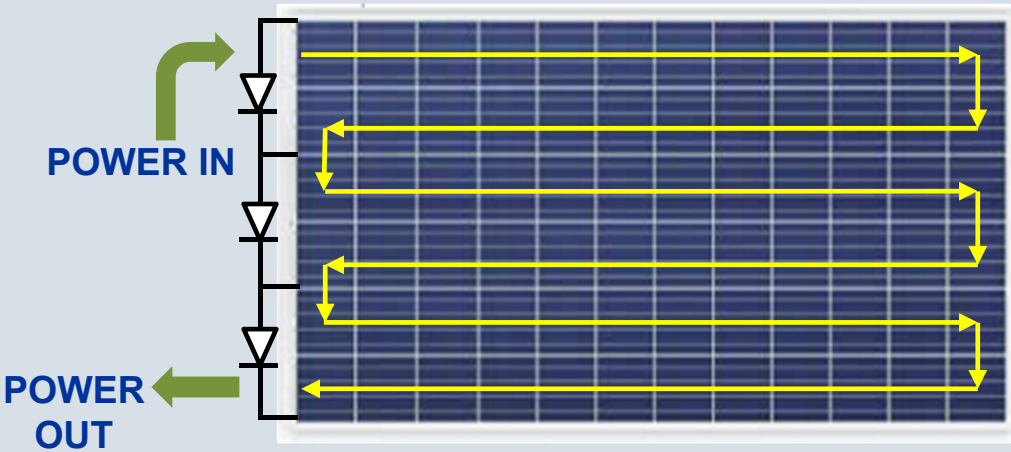
- 13% more power & 7% higher efficiency than Conventional panels plus 6% larger size¹

¹ Compared to a Conventional Commercial Panel (310W, 16% efficient, approx.1.94m²).

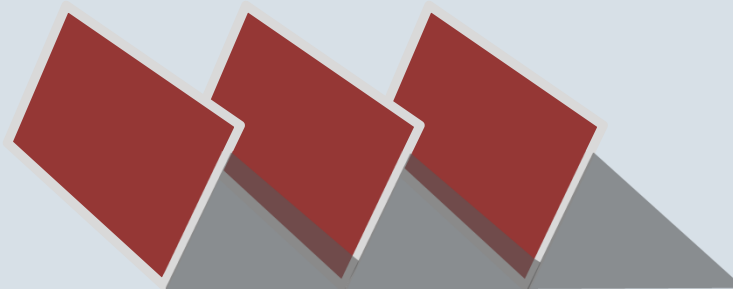
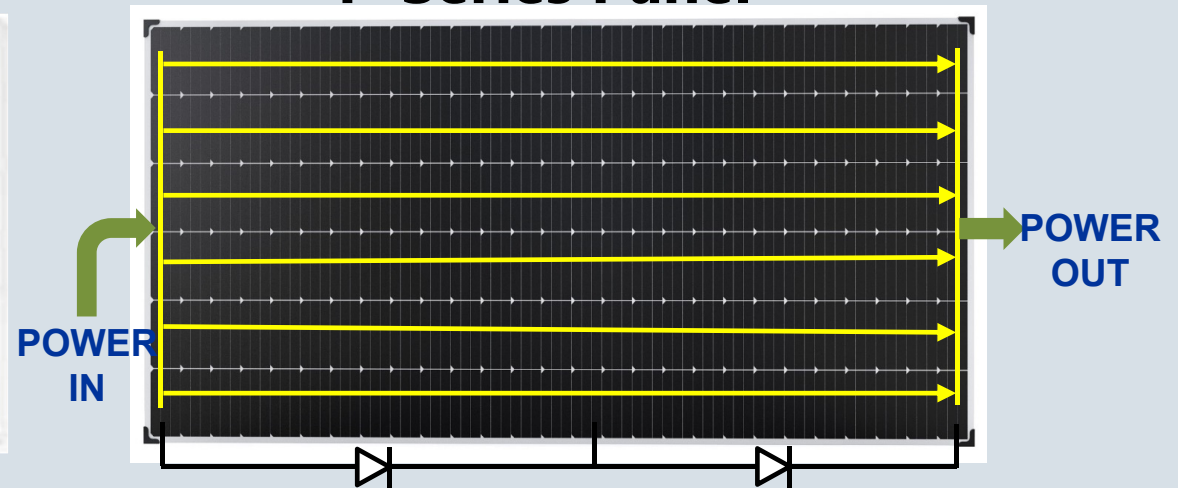
SunPower® Performance Series 1500 Volt | P19

P-Series parallel circuit architecture → better current redistribution under partial shading

Conventional Panel



P-Series Panel

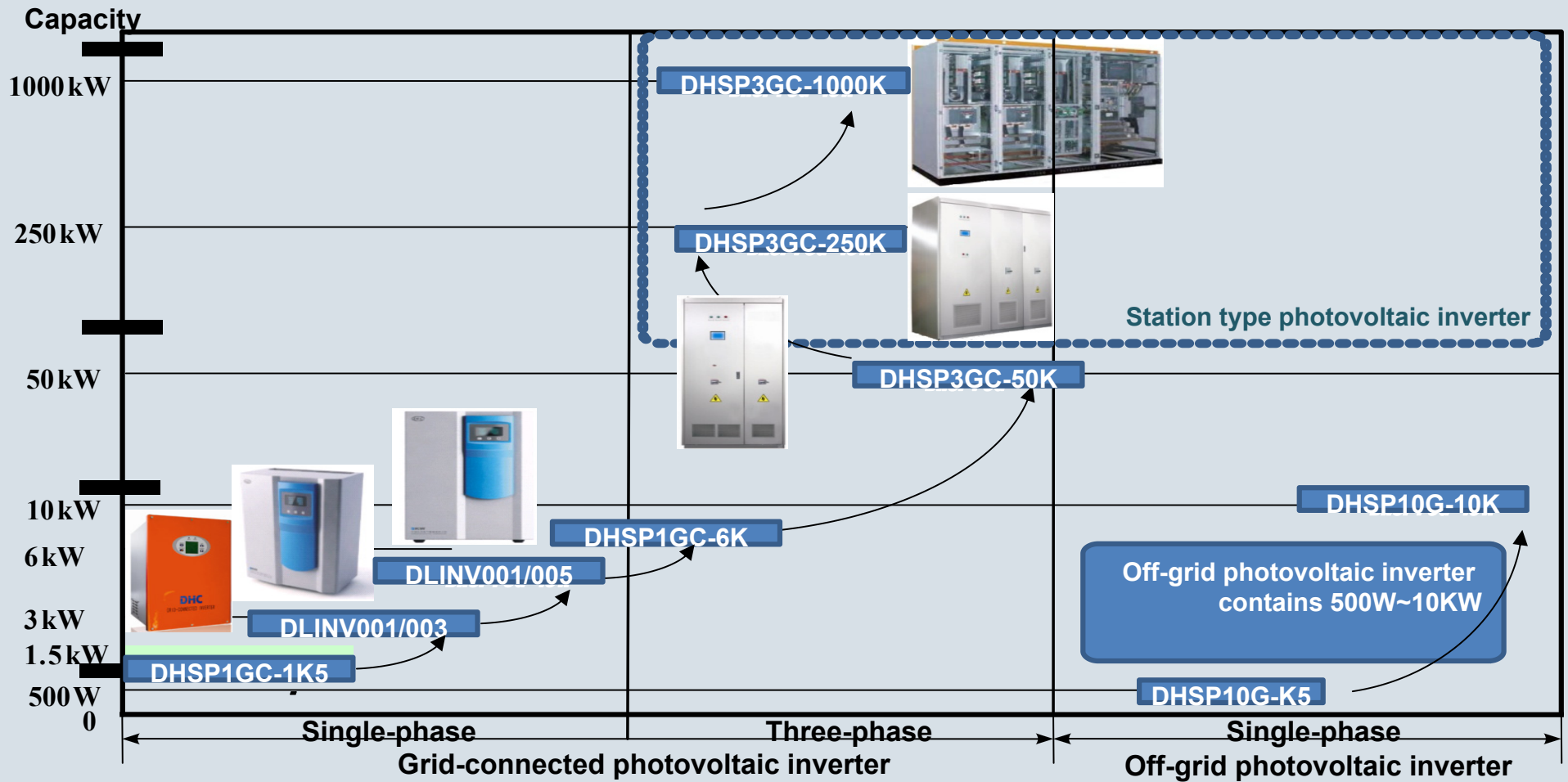


DEC PV Inverter

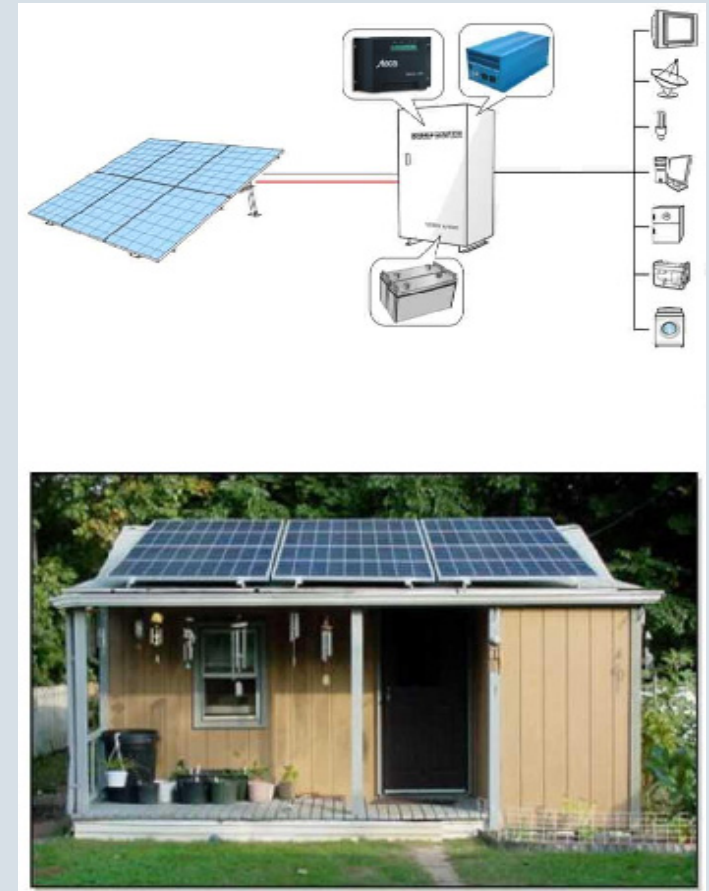
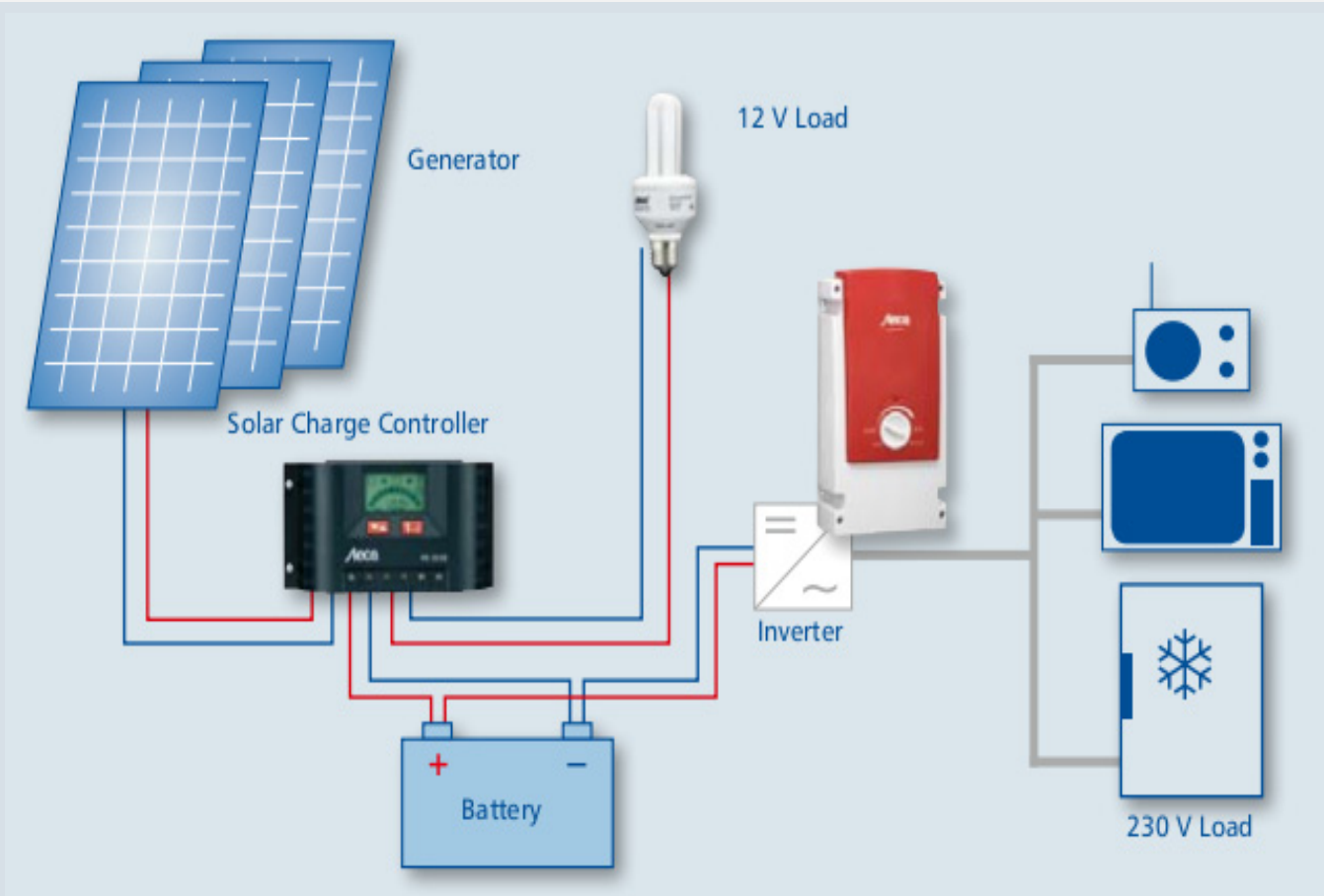
- Digital DSP Control and High Efficiency
- Original Intelligent Power Module (IPM)
- Maximum Power Point Tracing (MPPT) Control Technology, Real-time Tracing of the Maximum Power of PV Cells
- Pure Sine Wave Output, Automatic Synchronization and Grid-Interconnection, Low Current Harmonics, No Pollution, No Impact on Power Grid
- Anti-islanding Detection Technology
- Complete Fault Protection and Alarming Function With High Reliability
- Multi-language LCD
- RS422/RS485 Communication Interface, Remote Data Acquisition and Monitoring



DEC PV Inverter



DEC Solar Home System



An aerial night view of a city with a hand holding a glowing model of a skyscraper. The background is a blue-tinted aerial view of a city at night, with many buildings lit up. In the foreground, a hand is holding a glowing, translucent model of a skyscraper, which is also lit up. The overall scene is set against a dark blue background.

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DEC
Partners



东方电气
DONGFANG ELECTRIC

PV Module Strategic Partner



- Polycrystalline Module & Monocrystalline Module
- Large Ground Power Station & Industrial and Commercial Roof Power Station & Domestic Power Station



- Nominal Power: 265Wp~390Wp
- Maximum Efficiency: 16.2%~19.4%
- IEC & EN & USA & GB Standard
- High Reliability & Efficiency
- Global & 24 Hours Service System



PV Inverter Strategic Partner



- Centralized Inverter & String Inverter & Household Inverter
- Rated AC Power: 1kW~3400kW
- Maximum Efficiency: 98.2%~99.0%
- Ingress Protection Level Up to IP68
- IEC & EN & USA & GB Standard
- Intelligent Monitoring and Fast Trouble-shooting
- Widely Used in High Temperature, High Humidity, Sand, Salt Spray and Other Harsh Environments.

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DEC Projects



Typical PV Reference Projects (Overseas)



- **SPP Capacity: 6*2MW+2*1MW**
- **Contract Sign: April 24th, 2017**
- **Client: PRODEL**
- **Price: 242 Million USD**
- **Work Scope: EPC & 1 Year OM**
- **Work Duration: 16 Months**
- **The First Batch of Diesel Power & Solar Hybrid Project in Angola**

95 MW Diesel Power & Solar Hybrid project



ANGOLA



Typical PV Reference Projects (Overseas)



Angola



- Trina TSM-PD 14 & TSM-PE14A
- 72 Cells Polycrystalline Module
- Nominal Power: 320Wp~325Wp
- Maximum Efficiency: 17.3%
- Temperature: -40°C to $+85^{\circ}\text{C}$
- IEC/ UL/ ISO/ TUV Certification
- 10 Year Product Warranty
- 25 Year Linear Power Warranty

95 MW Diesel Power & Solar Hybrid project

Typical PV Reference Projects (Overseas)



Angola



- **Sungrow SG-500MX**
- **1000Vdc Outdoor Centralized Inverter**
- **Integrated Dry-type Transformer, Power Distribution Panel, Protection Device**
- **Nominal AC Output Power: 500kW**
- **Maximum Efficiency: 99.0%**
- **Temperature: -30° C to +65° C**
- **IEC/ CE/ IEEE/ GB Certification**

95 MW Diesel Power & Solar Hybrid project

Typical PV Reference Projects (Overseas)



- **SPP Capacity: 23MW**
- **Contract Sign: May 30th, 2016**
- **Client: Thai Appliance Industry Public Company Limited**
- **Price: 20.7 Million USD**
- **Work Scope: EPC**
- **Work Duration: 8 Months**
- **Local Operation and Maintenance**

Thailand 23MWp Solar Power Project



Typical PV Reference Projects (Domestic)



Xining Nanchuan Industry Park 10.1MWp Rooftop PV Project

Typical PV Reference Projects (Domestic)



Jiuquan Dongdongtan 29MWp Solar Power Project



Jiangsu Pizhou 30MWp Solar Power Project

Thanks!

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