

JA SOLAR

**JA Solar
Company Presentation**

Company Overview



Headquarters

- Beijing, China

Date est. / IPO

- May 2005 / February 2007 (NASDAQ: JASO)

Capacity Guidance by end of 2017

- 7 GW solar module
- 6.5 GW solar cell
- 3 GW silicon wafer

Shipments

- 2014: 3.1 GW ■ 2016: 5.2GW
- 2015: 4.0 GW ■ 2017: guidance 6.5-7GW

Employees

- 13,524 as of June 2017

Business Highlights

- Industry Leader
- Solid Finance
- Optimized Vertically Integrated Model
- Global Market Coverage and Diversified Customer Base
- Advanced Innovation

Products Advantages

- High conversion efficiency
- High reliability
- High yield efficiency

Advanced Innovation

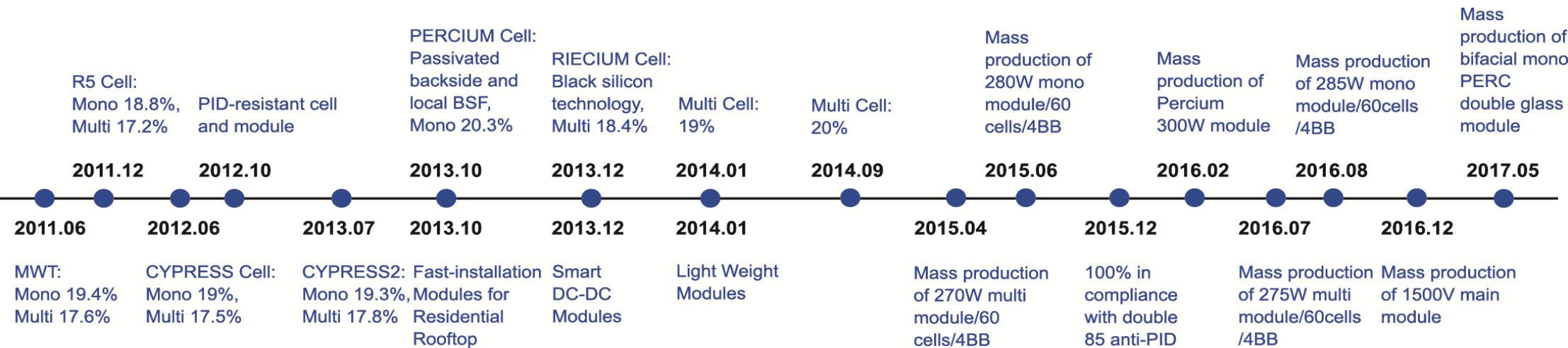
- **Global leader of PV cell technologies through innovation and invention**
 - PV technology leader with a six-month leading edge ahead of the others
 - The first company in the world started mass producing and commercializing selective emitter, MWT, and PERC structured PV cells
 - The first company in the world applied double-printing technology to all cell manufacturing lines

- **Industry front runner of PV module performance based on proprietary technical approaches**
 - The efficiency of independent innovation main products-Cypress 5 cell is 0.4% higher than the industry average.
 - The conversion efficiency of PERCIUM mono cell is 1.3% higher than the industry main products.
 - The conversion efficiency of RIECIUM mono cell is 0.6% higher than the industry main products.

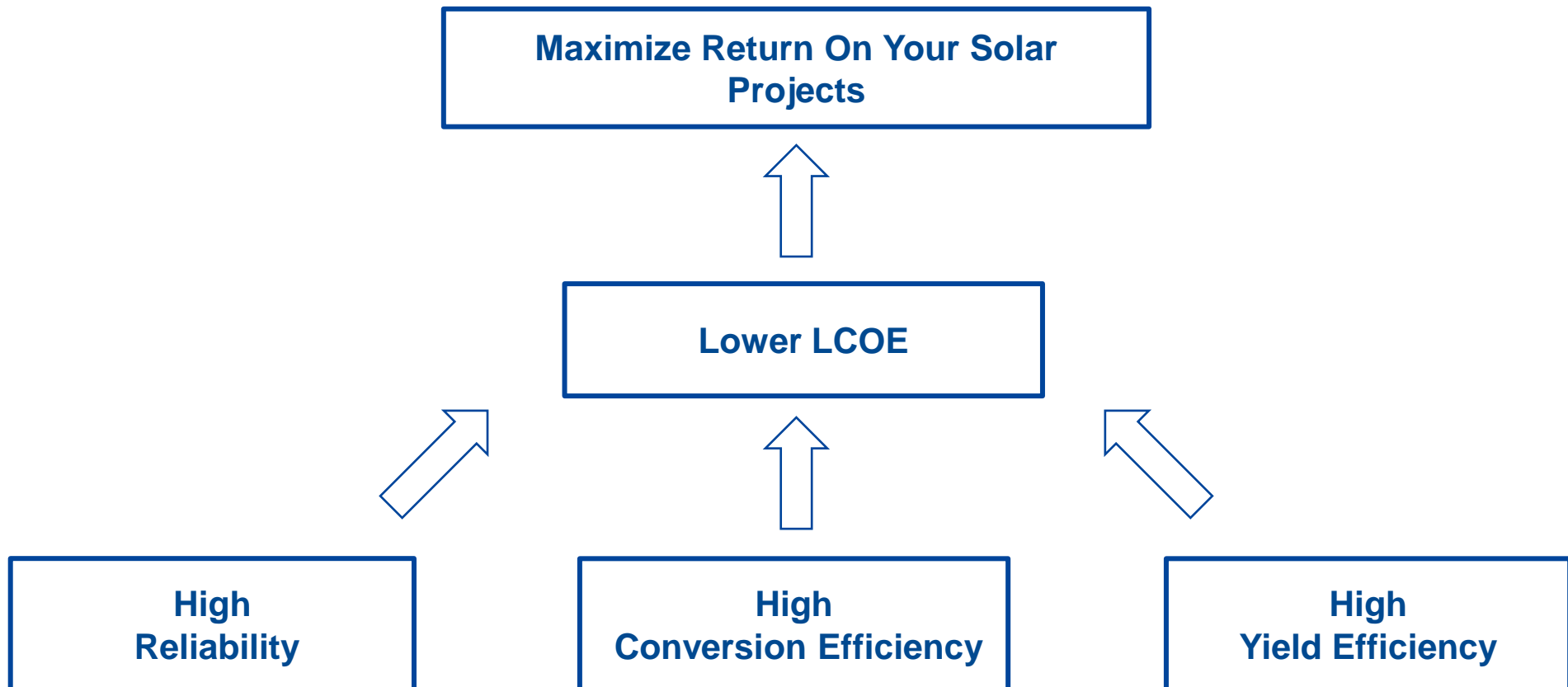


Advanced Innovation

—Product and R&D Milestones

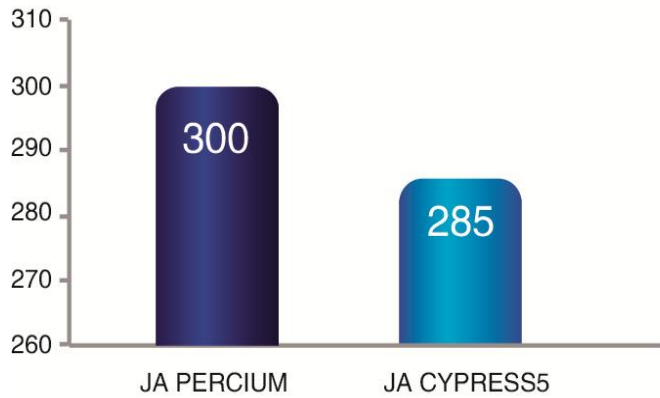


Product Advantages

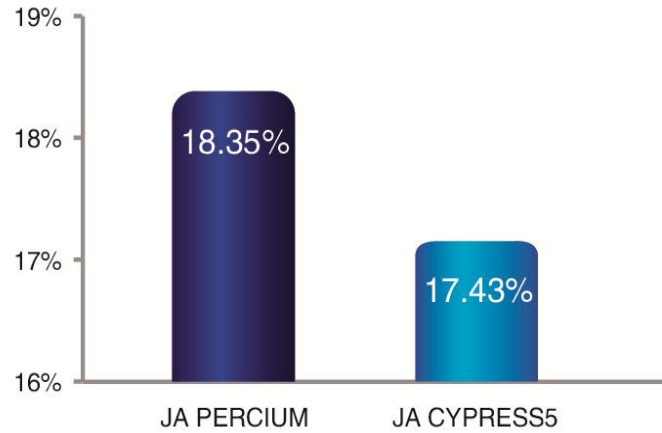


High Conversion Efficiency

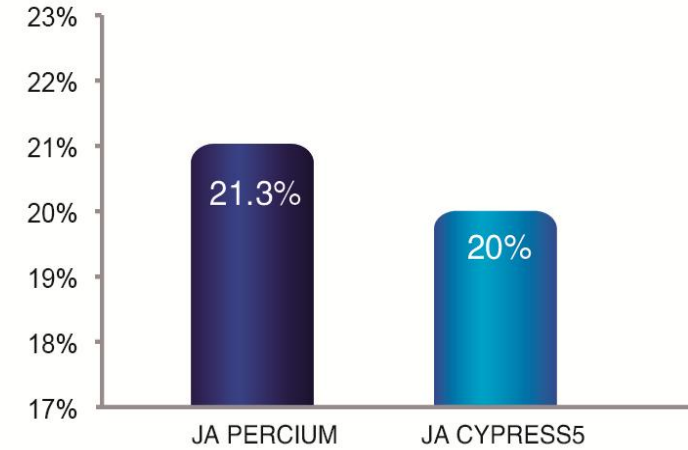
Mono Module Power Comparison (60 Cells/W)



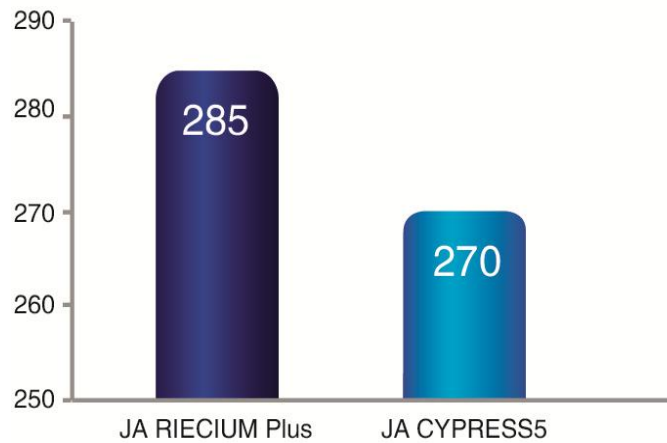
Mono Module Conversion Efficiency Comparison



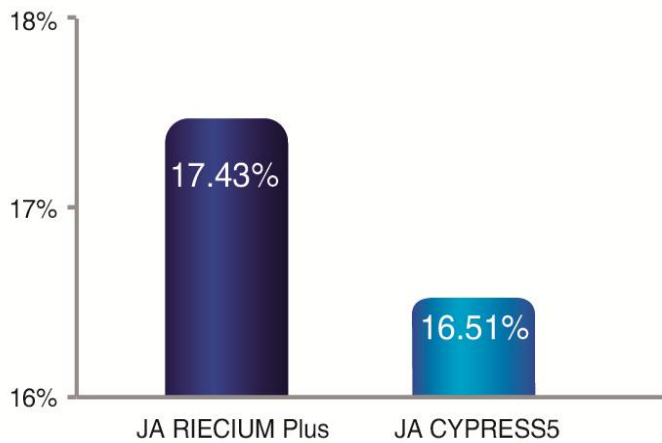
Mono Cell Conversion Efficiency Comparison



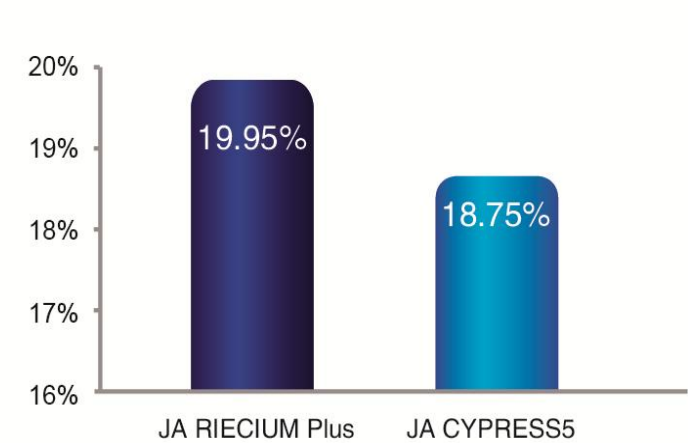
Multi Module Power Comparison (60 Cells/W)



Multi Module Conversion Efficiency Comparison



Multi Cell Conversion Efficiency Comparison



100% Positive Power Tolerance:0~+5W

Product Advantages – High Reliability

—Industry-leading Cell Technology

- World-class cell R&D staff and research platforms, leading other manufacturers by 6 months in cell R&D since 2008
- The only PV manufacturers company 100% implementing high-aspect-ratio double-printing in the industry
 - ✓ Addresses contact resistance and solderability optimization without compromising one or another
 - ✓ Less finger interruption
- Superior PID-resistance performance



Single Printing



Double Printing

Product Advantages – High Reliability

——High-quality Components from Best Suppliers

■ EVA

- ✓ High transparency, reliable quality
- ✓ High durability against PID degradation and UV yellowing

■ Back Sheet

- ✓ Fluoride material ensures excellent resistance against harsh environment and low water vapor penetration

■ Junction Box

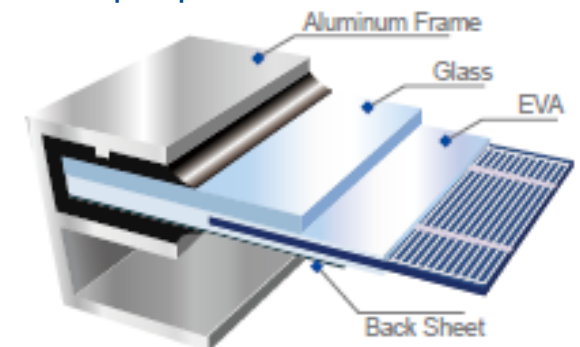
- ✓ Source from reputable tier 1 diode manufacturers to reduce hot spot risks
- ✓ Potted J-Box ensures excellent ingress protection performance

■ Glass

- ✓ Closed Nanoscale structure AR-coating ensures excellent reliability and anti-soiling performance
- ✓ High transparency, reliable quality
- ✓ Excellent scratch resistance

■ Aluminum Frame

- ✓ Outstanding surface treatment technology and higher line density ensure strong corrosion resistance and mechanical strength
- ✓ High salt & ammonia resistance



Product Advantages – High Reliability

- 100% in-house automatic module manufacturing to guarantee product quality and performance
- Manufacturing Process, Quality, and Facility Certified by TÜV SÜD, CTF and ETL, and Third-Parties Agencies Including PI-Berlin and Solar-IF

- **Long-term Reliability Tests**

- ✓ Mechanical load test 5400Pa to 10000Pa (about 2×IEC standard)
- ✓ HAST test DH1000 (85°C and 85% RH) to 121°C 3 times atmospheric pressure and 100%RH
- ✓ Thresher test (about 3×IEC standard)

IEC Standard test	Thresher test
Thermal cycling, 200 cycles	Thermal cycling, 600 cycles
Damp heat 1000 hour	Damp heat 3000 hour
UV 15KWH	UV 45KWH
Humidity freeze 10 cycles	Humidity freeze 30 cycles
Hot spot endurance 5 hour	Hot spot endurance 20 hour

- **Environment Endurance Tests**

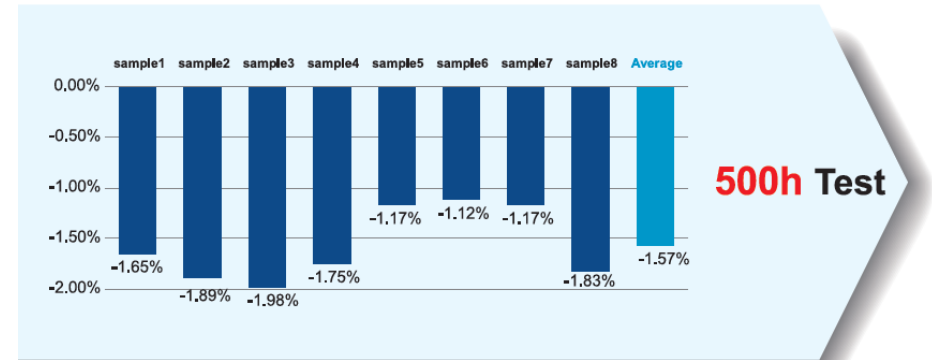
- ✓ Ammonia Resistance Test Salt Mist Spray Test, SO2 Resistance Test, Dust and Sand Test
- ✓ Hot-Dry Climate, Damp-Heat Climate, and Plateau Climate Conditions



Product Advantages – High Reliability

- 100% Mass-production of PID-resistant Cell and Double 85 Anti-PID 96 hours test standard for All Modules

✓ PID: Potential Induced Degradation



RIECIUM Module Degradation After 500-hour PID Test
(Test Condition: 85%RH 85°C -1000V 500Hr)

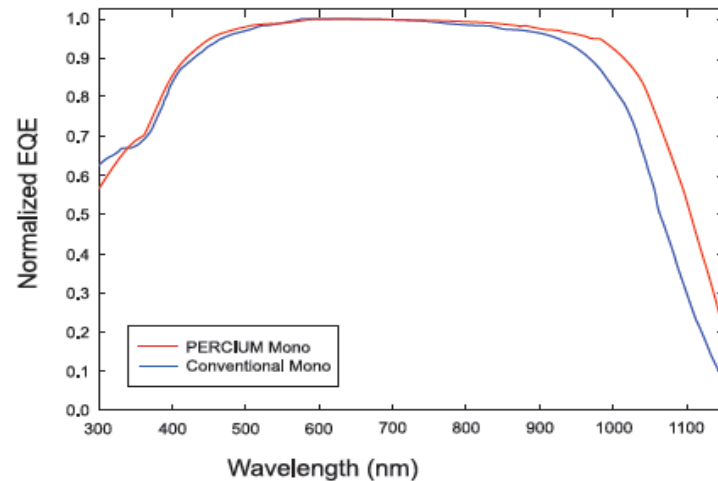


- Excellent Quality Management System and Product Quality Assurance

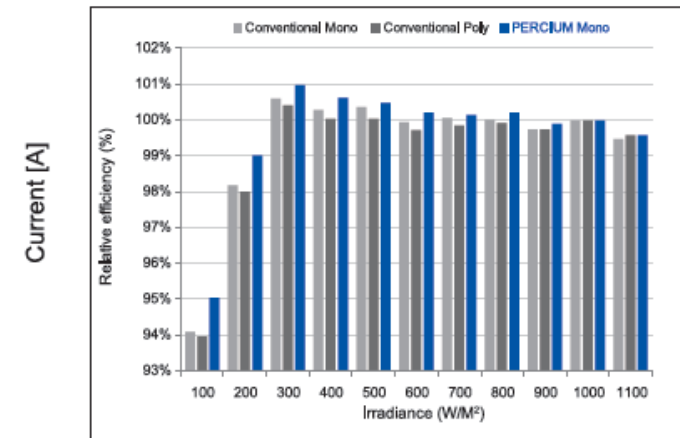


Product Advantages – High Yield Efficiency

■ Outstanding Low-light Performance



EQE—External quantum efficiency



Relative module efficiency comparison under different irradiance

Source: 

■ The modules are classified into three current category

- ✓ Current class—H (high)
- ✓ Current class—M (middle)
- ✓ Current class—L (low)



Current class-M

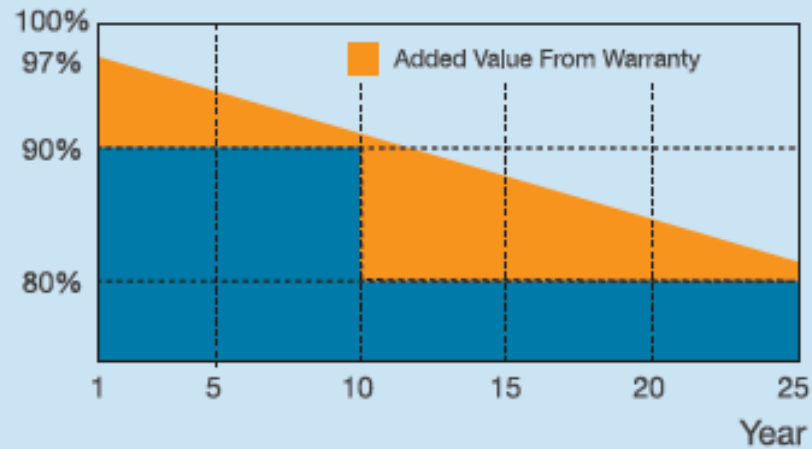
After Sale Service

■ Product Warranty

- ✓ 12-year warranty on materials and workmanship
- ✓ 25-year linear power warranty (>80%)

■ Additional Insurance Options

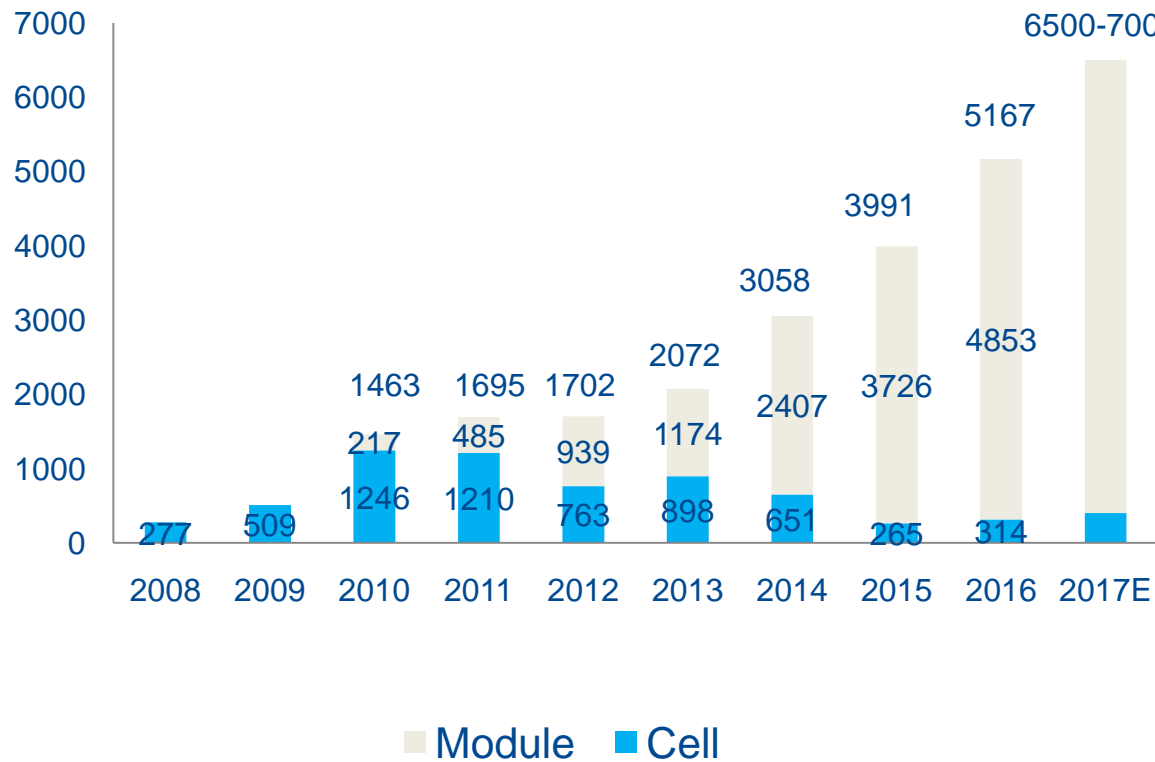
- 12-year product warranty
- 25-year linear power output warranty



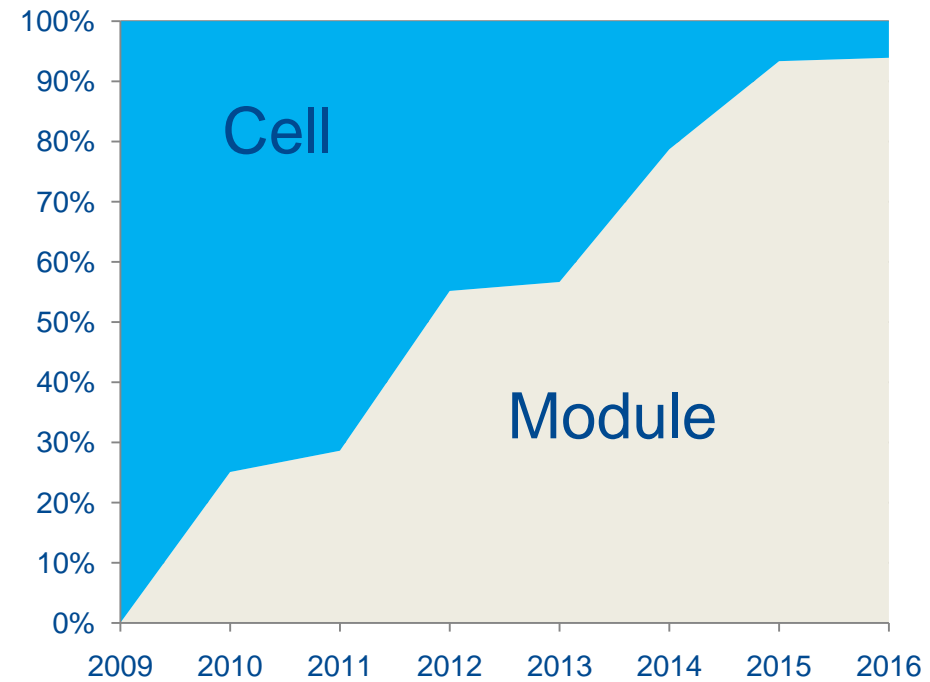
Industry Leader

—more than 25GW cumulative shipments by the end of 2017 Q3

Shipment (MW)



Shipment Ratio (%)



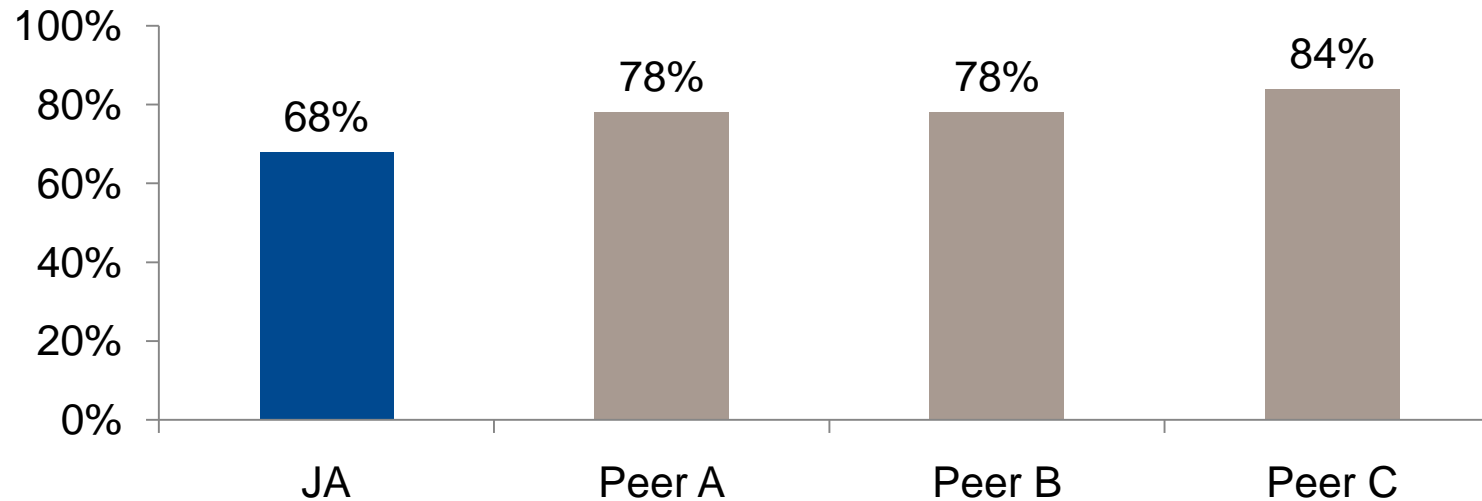
Global Leading Bankable Module Brand

2017 Top Bankable Module Brands by BNEF survey

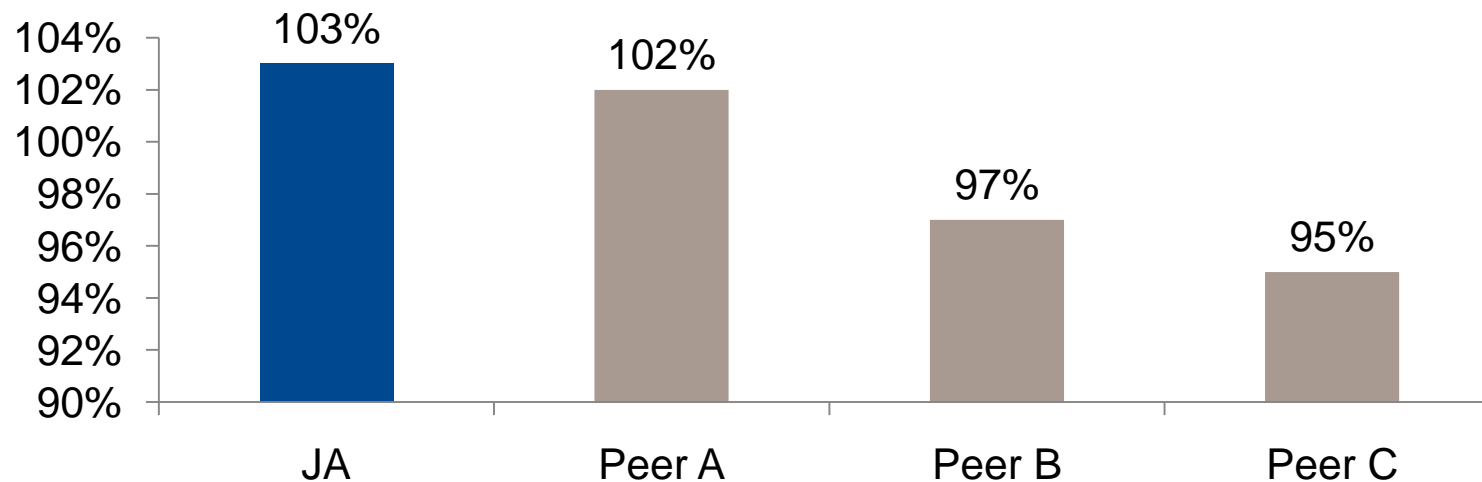
Rank	PV Module Manufacturer	'Bankable'	'Never Heard'	'Not Bankable'
1	Canadian Solar	100%	0%	0%
2	First Solar	100%	0%	0%
3	JA Solar	100%	0%	0%
4	Jinko Solar	100%	0%	0%
5	Kyocera	100%	0%	0%
6	SunPower	100%	0%	0%
7	Trina	100%	0%	0%
8	LG Electronics	94%	6%	0%
9	Panasonic	94%	6%	0%
10	Solar Frontier	94%	6%	0%
11	Hanwha Q CELLS	94%	0%	6%
12	REC Group	88%	6%	6%
13	Hyundai Heavy	81%	13%	6%
14	Sharp	75%	6%	19%
15	Renesola	75%	0%	25%
16	Talesun	69%	13%	19%
17	ET Solar	63%	25%	13%
18	Suntech	56%	6%	38%

Solid Finance for Future Growth

Debt Ratio

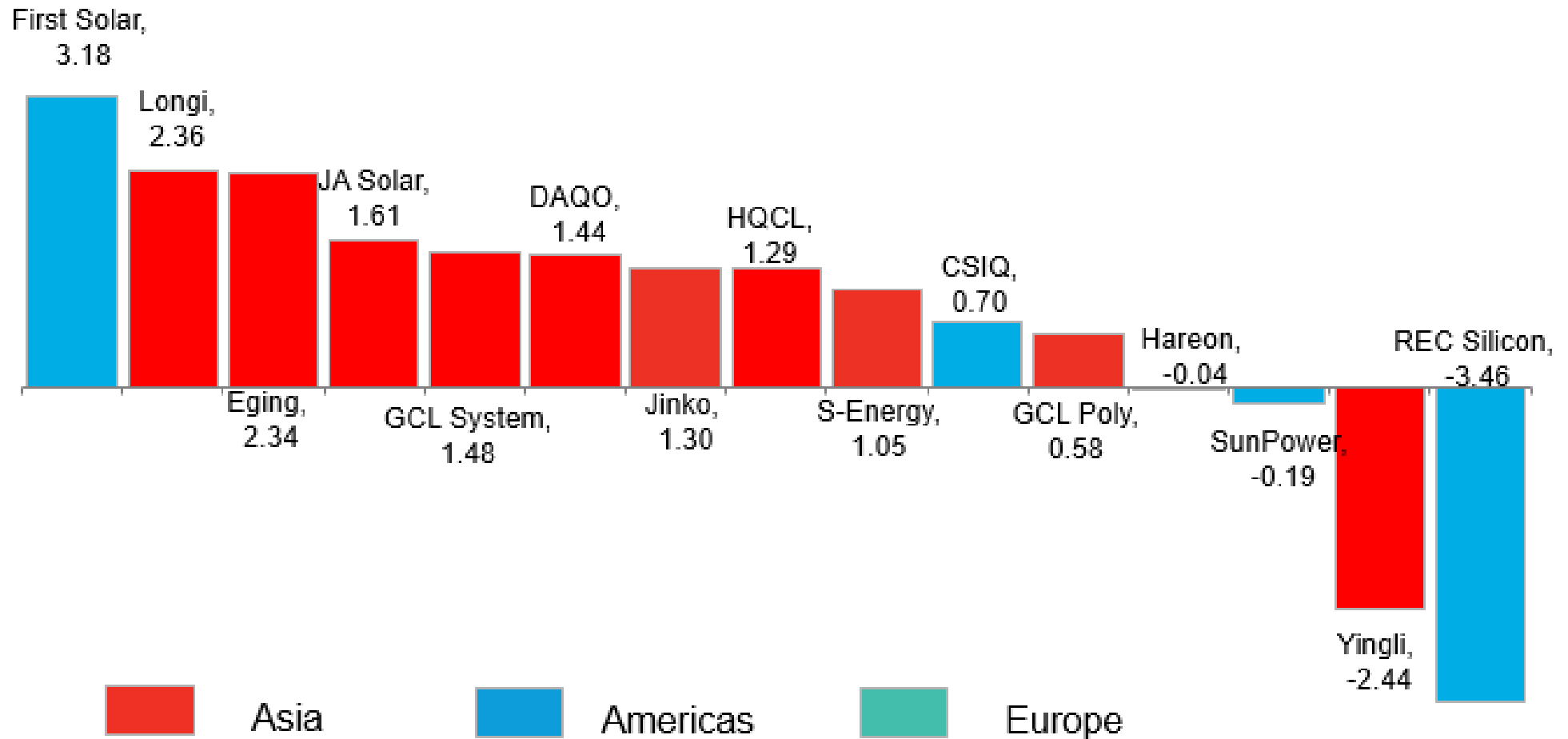


Current Ratio



Solid Finance for Future Growth

—Altman-Z scores of solar companies pure players



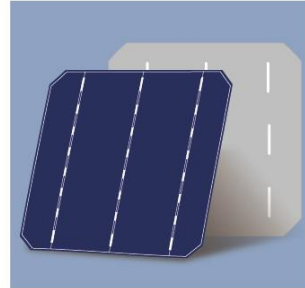
Optimized Vertically Integrated



Polysilicon



Silicon Wafer
3 GW



Cell
6.5 GW



Module
7 GW



System

JA SOLAR

State-of-The-Art Production Facilities



Ningjin Cell and Module Facility
Hebei Province
Cell: 2500 MW Module: 600 MW



Baotou Facility
Inner Mongolia
Under the construction



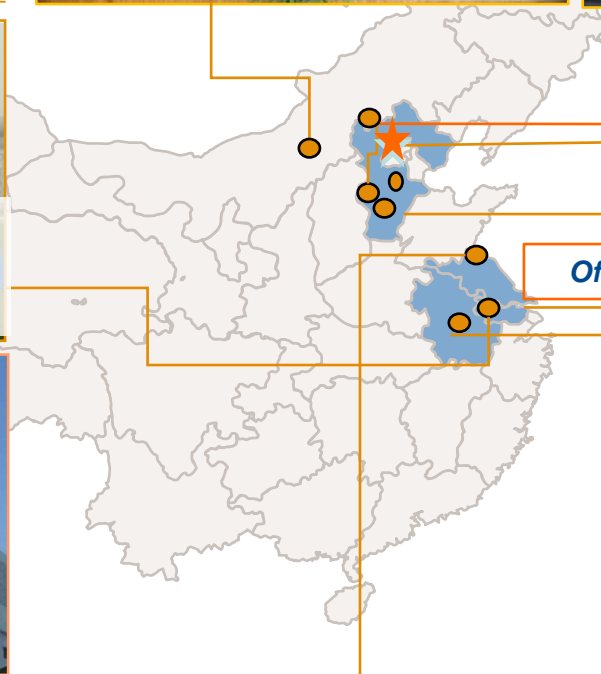
Zhangjiakou module Facility
Hebei Province
Under the construction



Xingtai Module Facility
Hebei Province
1600 MW



Yangzhou Cell and R&D Facility
Jiangsu Province
3000 MW



Headquarters in Beijing

Office in Shanghai



Fengxian Module Facility
Shanghai City 1500 MW
Lab partnership with TÜV and Intertek



JA Malaysia Cell Facility
1000MW



Hefei Module Facility
Anhui Province
3300 MW



Yanjiao Wafer Facility
Hebei Province
1500 MW



Lianyungang Wafer Facility
Jiangsu Province
1500 MW



JA Vietnam Wafer Facility
1500MW in the first phase

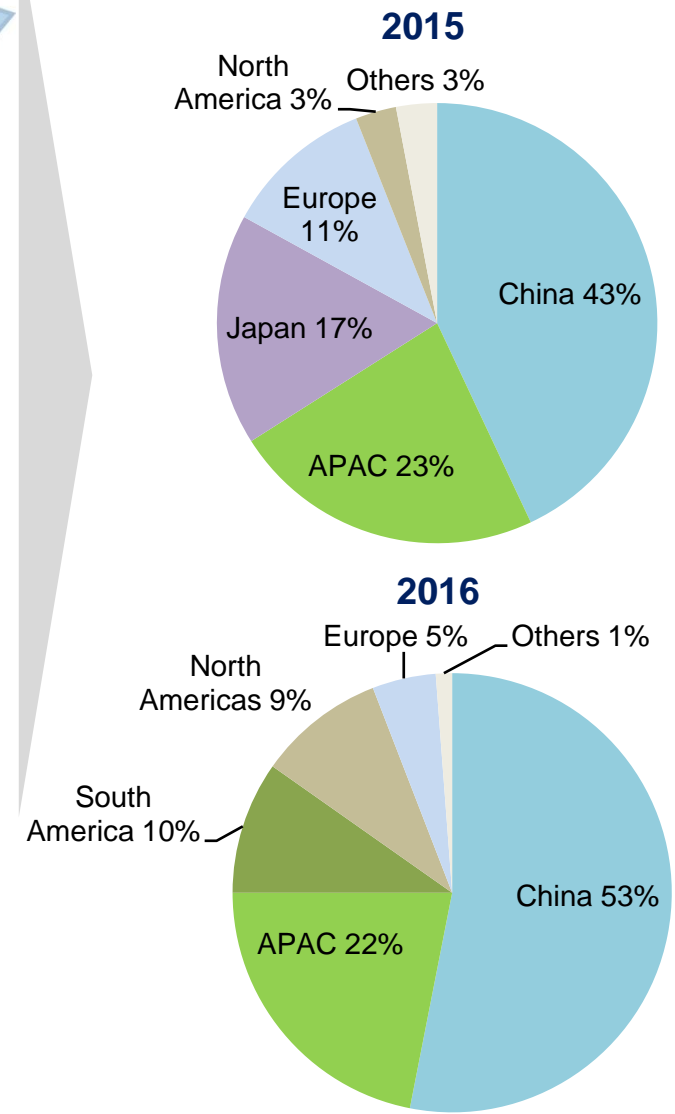
Global Market Coverage

—A global sales network over 100 countries



External shipments by region

(% of total MW shipped)



Top Brand PV Modules 2017 Europe

JA Solar ranks among the top PV brands in Europe according to the result of survey carried out by EUPD research among installers on brands awareness, customers' choice and distribution.



Diversified Customer Base

—partnerships with various global leading corporations



Selected Projects

Social Circle Solar Farm

Bank: Bank of America

Georgia USA

105 MW



100MW “Top runner” project in Datong, China

Datong, China

100 MW



Utility Ground Mount Project in UK

Chittering Great Knowles, UK

11.6 MW



Pakistan 100MW project in Bahawalpur Bank: Bank of Punjab / ADB (Asian Development Bank)

Bahawalpur, Pakistan

100 MW



Selected Projects

Ituverava 260MW Project

Bahia, Brazil

260 MW



Largest Solar Installation in Israel,

Arava Desert and Negev Desert, Israel

35 MW



30MW Project in Japan

Tomakomai, Japan

30 MW



India 115 MW project in Telangana

Telangana, India

115 MW



CSR – Corporate Activities

- **USA:** Donated modules to Stanford University for its construction of the Bioengineering & Chemical Engineering building.



- **China:** Sponsors Peking University, Tsinghua University, and Tongji University in their participation at the “Solar Decathlon SD”.



- **Haiti:** Following Haiti’s earthquake, JA donated PV modules to the local fish farmers for electricity generation



CSR – Corporate Activities

Sunshine project:

Since 2011, JA Solar has provided medical assistance for total 202 poor cataract patients. JA will continue to provide medical assistance to more poor cataract patients.

Hope primary schools project:

In 2016, JA Solar donated 2.85 million RMB to build 11 hope primary schools. JA have built 59 hope primary schools until now and we will continue this project.

Poor student assistance projects:

JA Solar will fund in total 10,000 poor students to complete their studies.



Harvest the Sunshine
Premium Cells, Premium Modules

Thank you !

JASOLAR

January 4, 2018