

JA Solar Company Presentation

Company Overview



Headquarters

- Beijing, China

Date est. / IPO

- May 2005 / February 2007 (NASDAQ: JASO)

Annual Capacity

- 5.5 GW solar module
- 5.5 GW solar cell
- 2.5 GW silicon wafer

Shipments

- 2014: 3.1 GW
- 2015: 4.0 GW
- 2016 guidance: 4.9-5.0 GW

Employees

- 12,550 as of end of 2015

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 to twelve-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



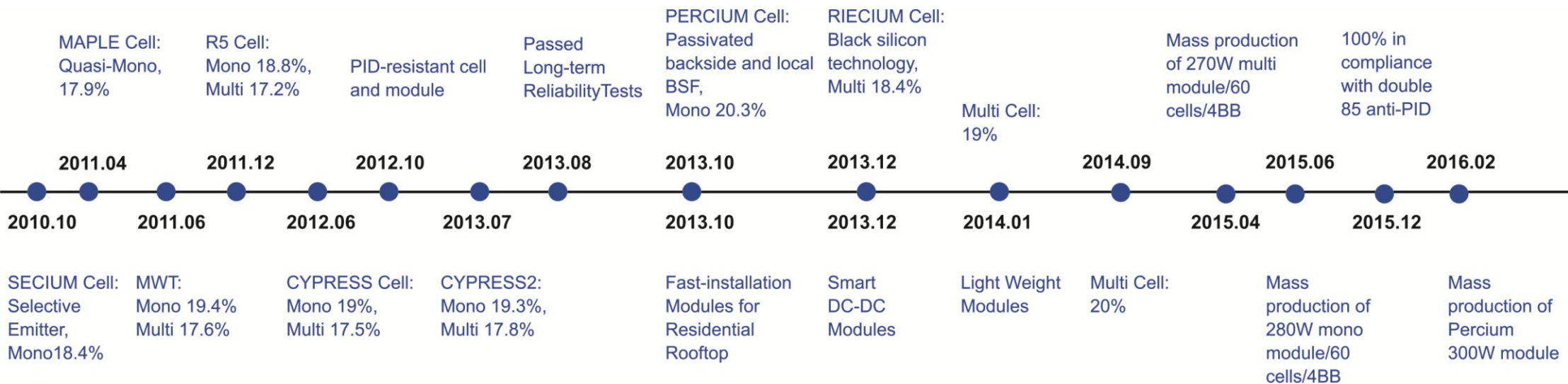
■ **Industry front runner of PV module performance based on proprietary technical approaches**

- Pursuing process optimization for PV modules assembly process, improving their performance and reliability, using proprietary technologies and various innovative approaches
- Consistently out-performing competitors' modules by 5-10watts in terms of power rating

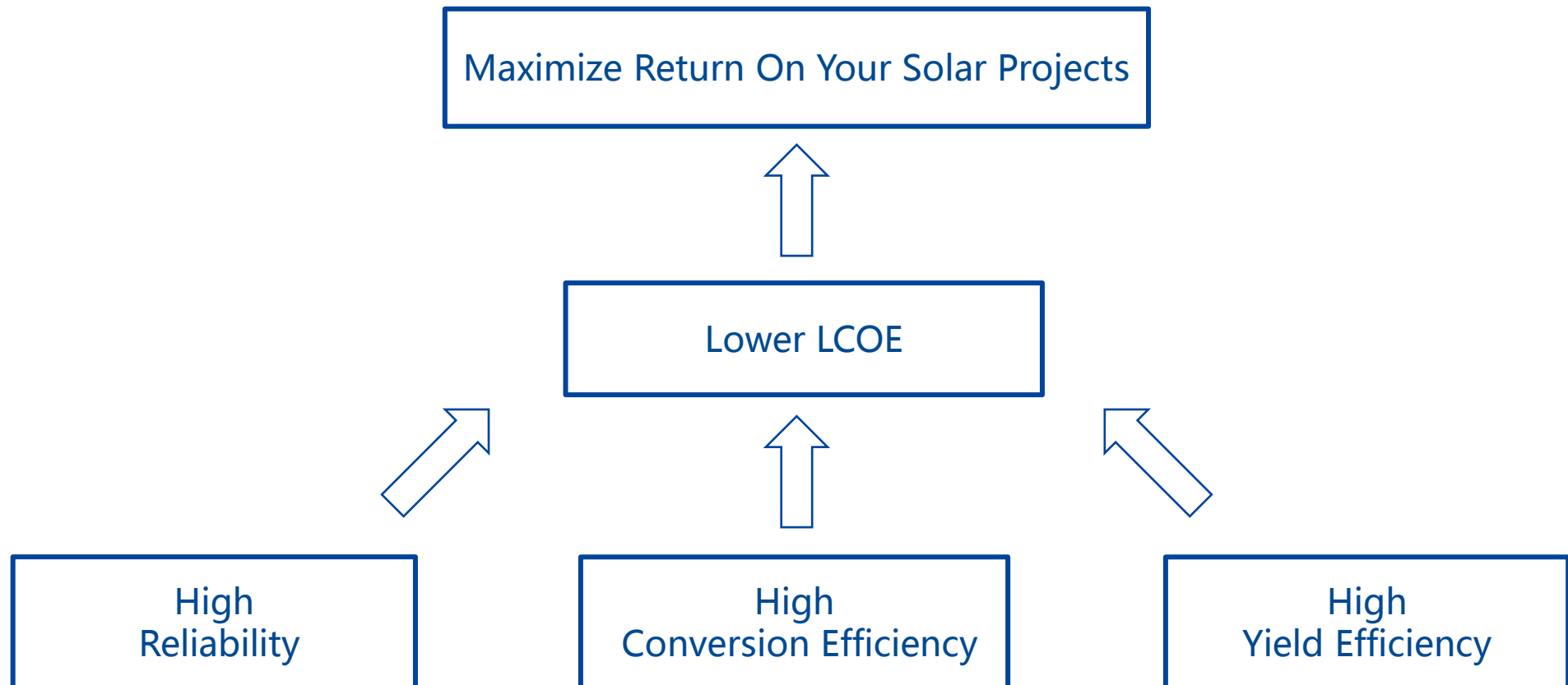


Advanced Innovation

—Product and R&D Milestones

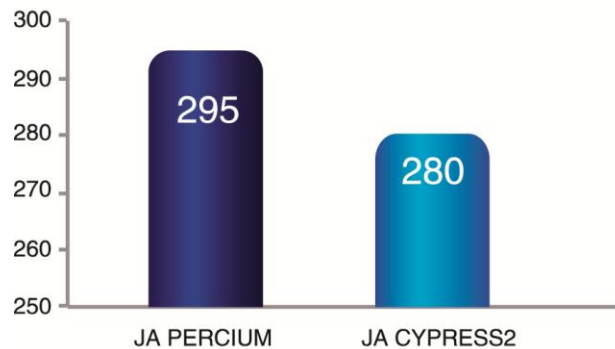


Product Advantages

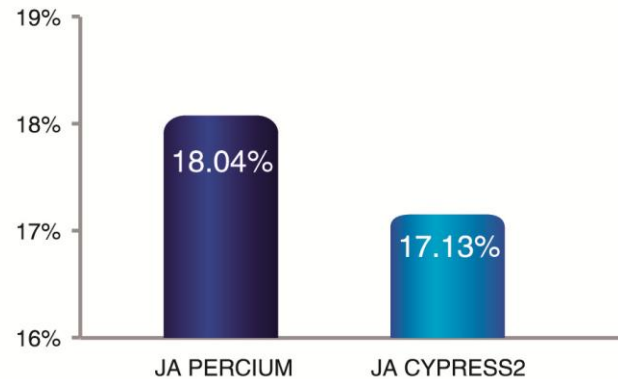


High Conversion Efficiency

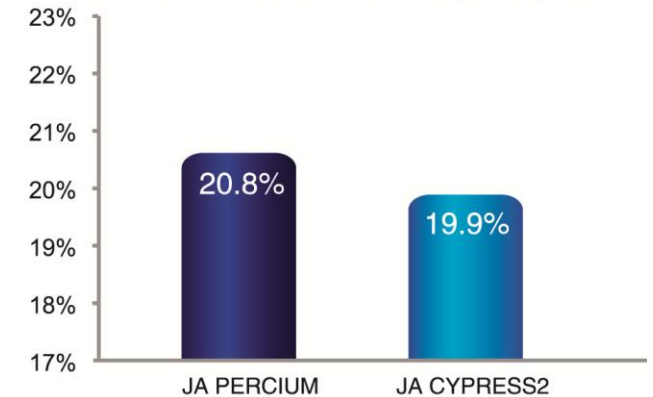
Mono Module Power Comparison (60 Cells/W)



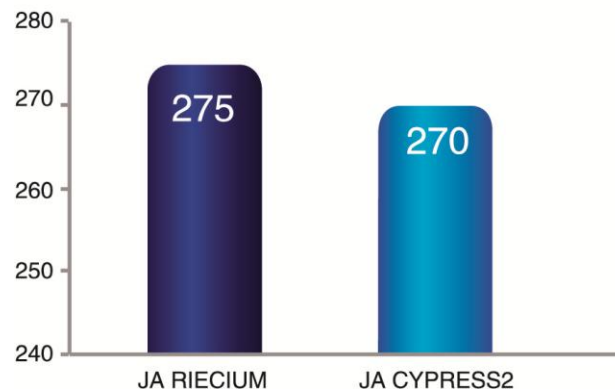
Mono Module Conversion Efficiency Comparison



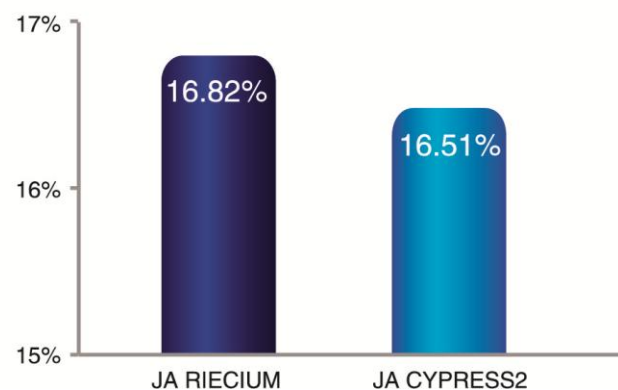
Mono Cell Conversion Efficiency Comparison



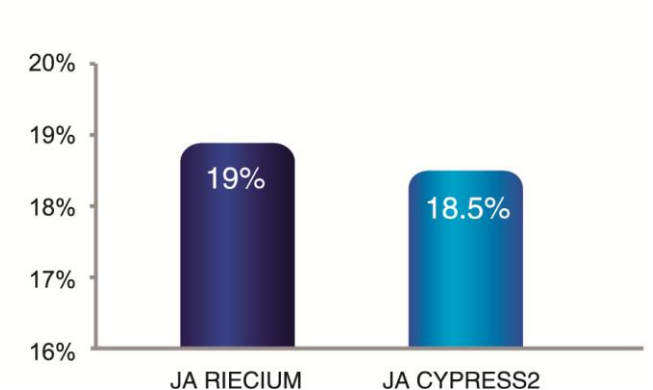
Multi Module Power Comparison (60 Cells/W)



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 facilities, leading other manufacturers by 6-12 months in cell R&D since 2008
- The only 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 permeation

■ Junction Box

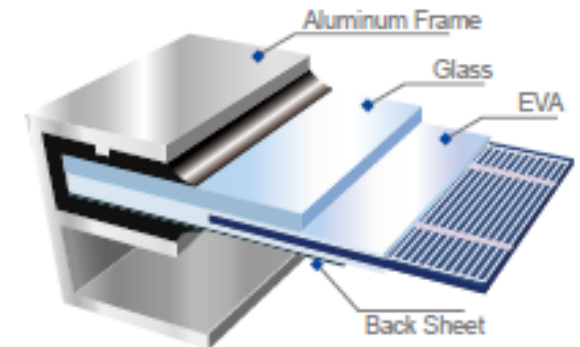
- ✓ Source from reputable tier 1 diode manufacturers to reduce hot spot risks
- ✓ Potted J-Box ensures excellent ingress protection performance

■ 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 $2 \times$ IEC standard)
- ✓ HAST test DH1000 (85°C and 85% RH) to 121°C 3 times atmospheric pressure and 100%RH
- ✓ Thresher test (about $3 \times$ IEC standard)

IEC Standard texts	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**

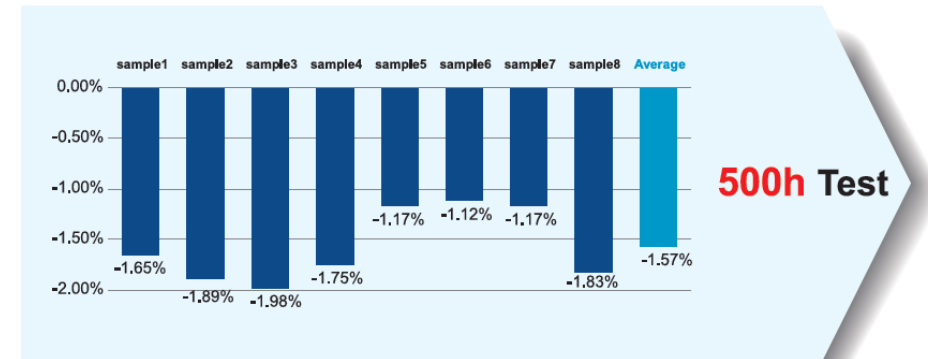
- ✓ Ammonia Resistance Test Salt Mist Spray Test, SO₂ Resistance Test, Dust and Sand Test
- ✓ Hot-Dry Climate, Damp-Heat Climate, and Plateau Climate Conditions



Product Advantages – High Reliability

■ 100% Mass-production of PID-resistant Cell and Double 85 Anti-PID for All Modules

- ✓ PID-Resistance Performance:
Potential Induced Degradation



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

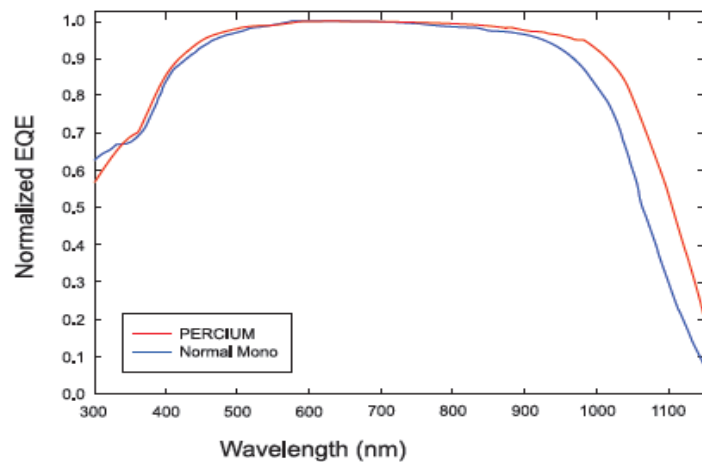


■ Excellent Quality Management System and Product Quality Assurance

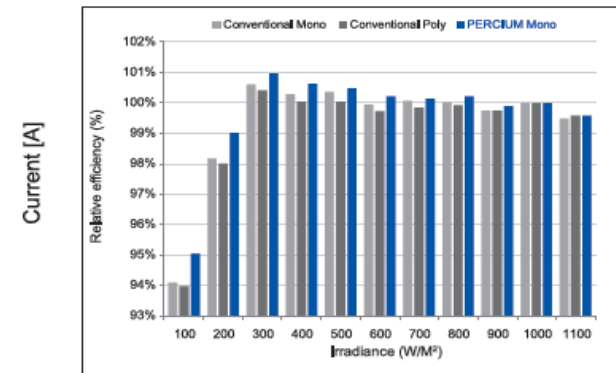


Product Advantages – High Yield Efficiency


■ Outstanding Low-light Performance



EQE—External quantum efficiency



Relative module efficiency comparison under different irradiance

Source: 

■ The modules are classified into three current category

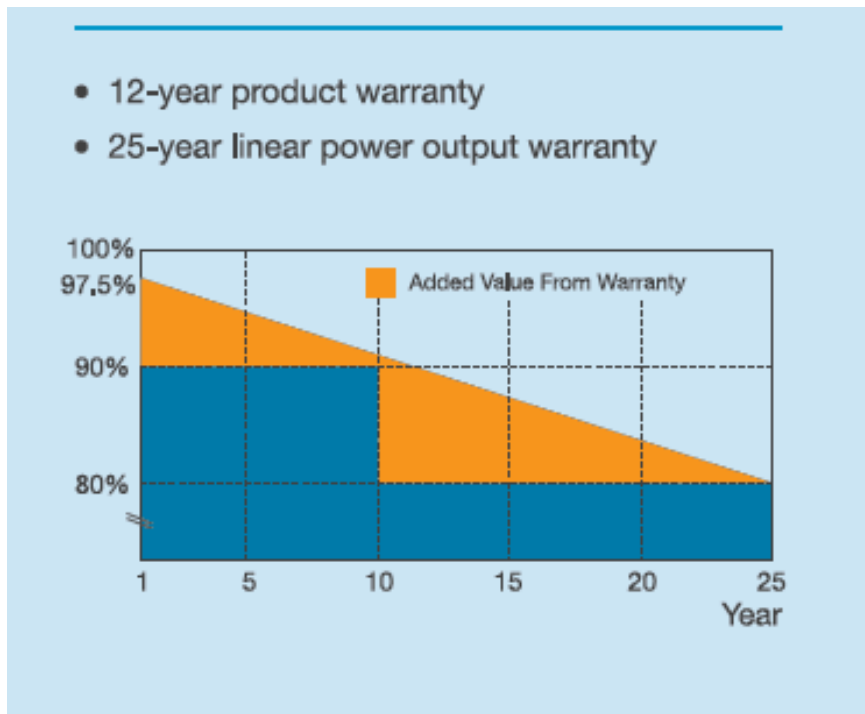
- ✓ Current class—H (high)
- ✓ Current class—M (middle)
- ✓ Current class—L (low)



After Sale Service

■ Product Warranty

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



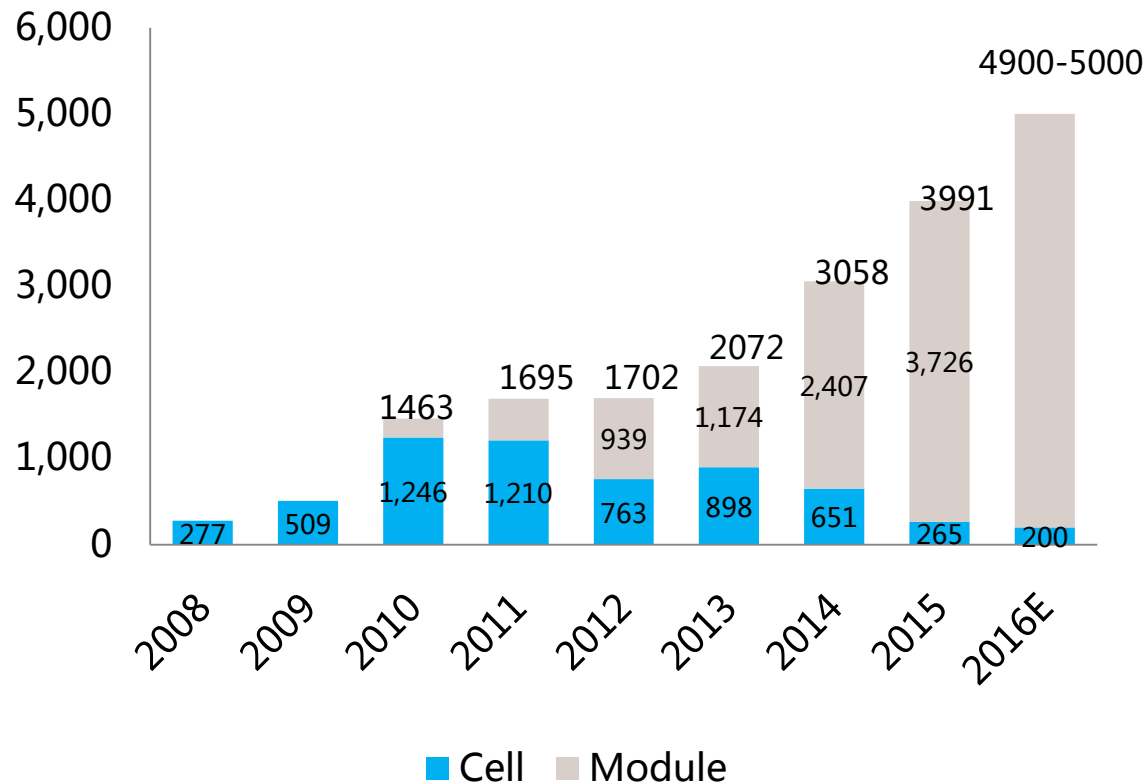
■ Additional Insurance Options



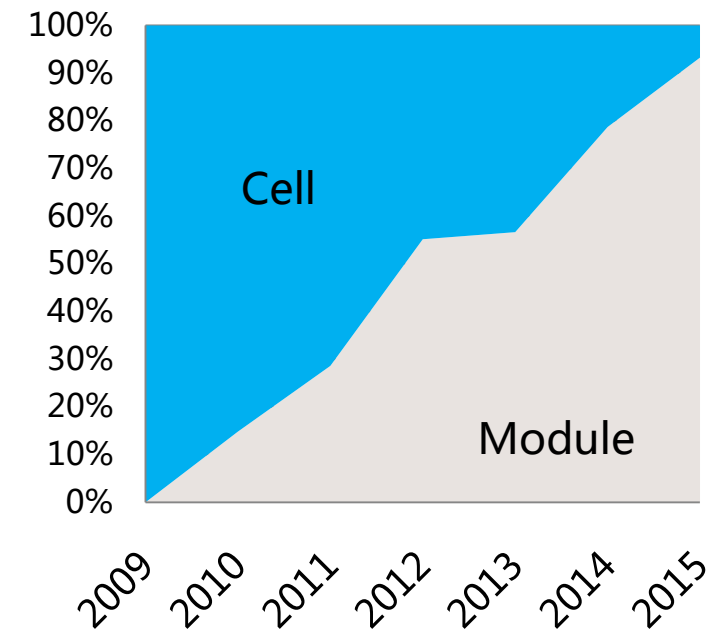
Industry Leader

—18.7GW cumulative shipments by the end 2016 Q3

Shipment (MW)



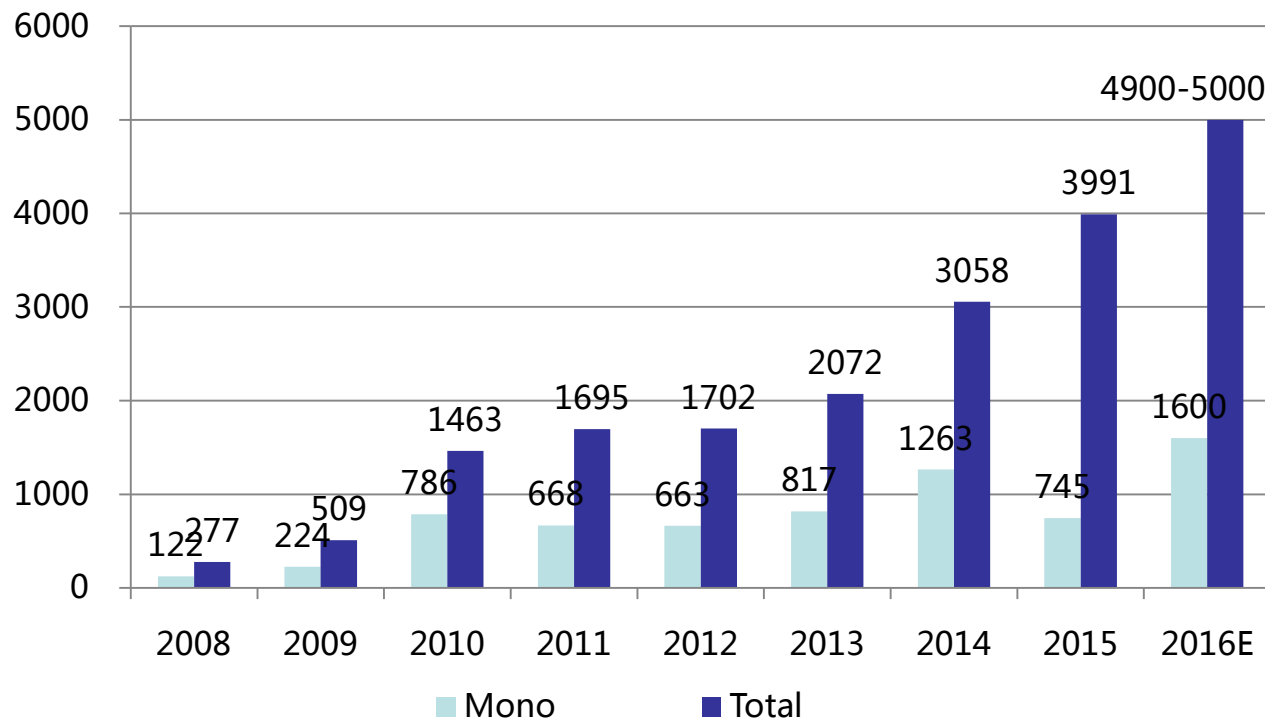
Shipment Ratio (%)



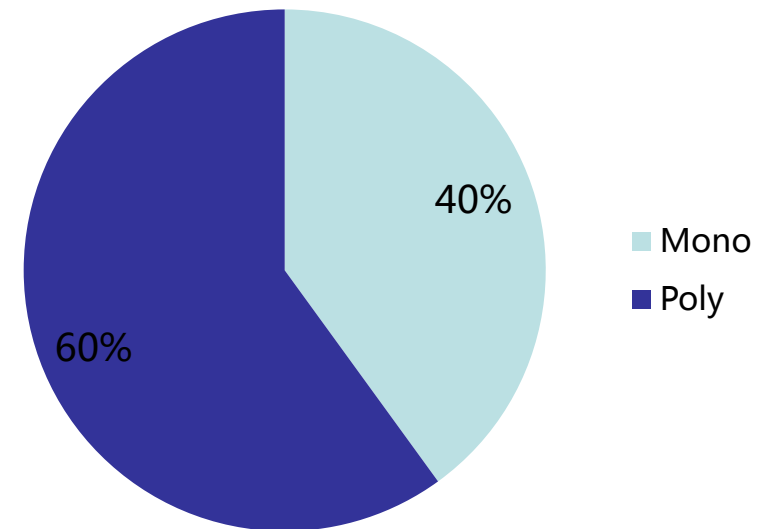
Industry Leader

——7GW cumulative Mono module shipments by the end of Nov 2016

Shipment (MW)



Cumulative shipment ratio(%)



Top 4 Module Manufacturer in 2015

Top 10 Module Manufacturers by PV-Tech

2015	Module Manufacturer
1	Trina
2	CanadianSolar
3	Jinko
4	JA
5	Hanwha Q CELLS
6	First Solar
7	Yingli
8	SFCE
9	Renesola
10	SunPower Corp

Source: PV-Tech

Global Leading Bankable Module

2014 Top bankable PV module brands by BNEF Survey

Rank	PV Module Manufacturer	'Yes'	'No'	'Never Heard'
1	First Solar	100%	0%	0%
2	Hanwha SolarOne	93%	7%	0%
3	JA Solar	93%	7%	0%
4	Trina Solar	93%	7%	0%
5	Yingli	93%	7%	0%
6	Hanwha Q-Cells	87%	13%	0%
7	Jinko Solar	87%	13%	0%
8	Canadian Solar	80%	20%	0%
9	Panasonic	80%	20%	0%
10	Renesola	80%	20%	0%
11	SunPower	80%	20%	0%
12	REC Solar	80%	7%	13%
13	Sharp	73%	27%	0%
14	Solar Frontier	73%	7%	20%
15	Mitsubishi	67%	33%	0%
16	Kyocera	67%	20%	13%
17	ET Solar	60%	27%	13%
18	SunEdison	60%	33%	7%
19	China Sunergy	53%	27%	20%
20	BYD	47%	47%	7%

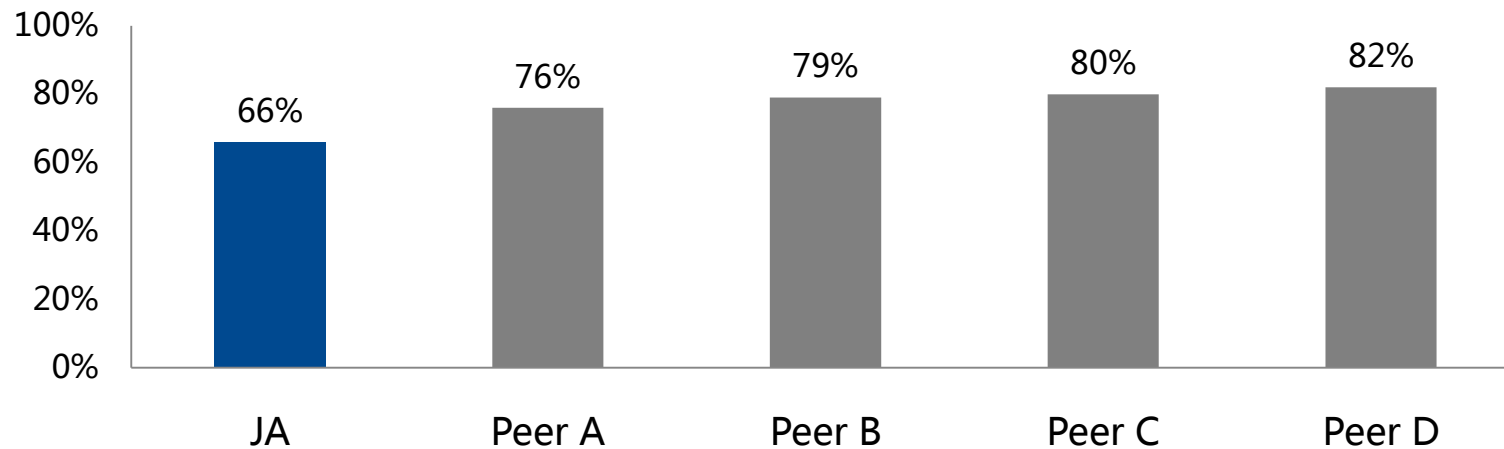
2016 Top bankable PV module brands by BNEF Survey

Rank	PV Module Manufacturer	'Yes'	'No'	'Never Heard'
1	Trina	100%	0%	0%
2	Hanwha Q Cells	95%	5%	0%
3	SunPower	95%	5%	0%
4	First Solar	95%	5%	0%
5	Canadian Solar	95%	0%	5%
6	JA Solar	91%	5%	5%
7	Kyocera	91%	9%	0%
8	Jinko	86%	14%	0%
9	Mitsubishi	86%	9%	5%
10	Panasonic	77%	14%	9%
11	LG Electronics	73%	14%	14%
12	REC Solar	73%	23%	5%
13	Samsung	73%	9%	18%
14	Sharp	73%	27%	0%
15	Renesola	68%	32%	0%
16	Solar Frontier	68%	18%	14%
17	SolarWorld	64%	18%	18%
18	Chint/ Astronergy	59%	18%	23%
19	Hyundai Heavy	59%	18%	23%
20	SunEdison	59%	32%	9%

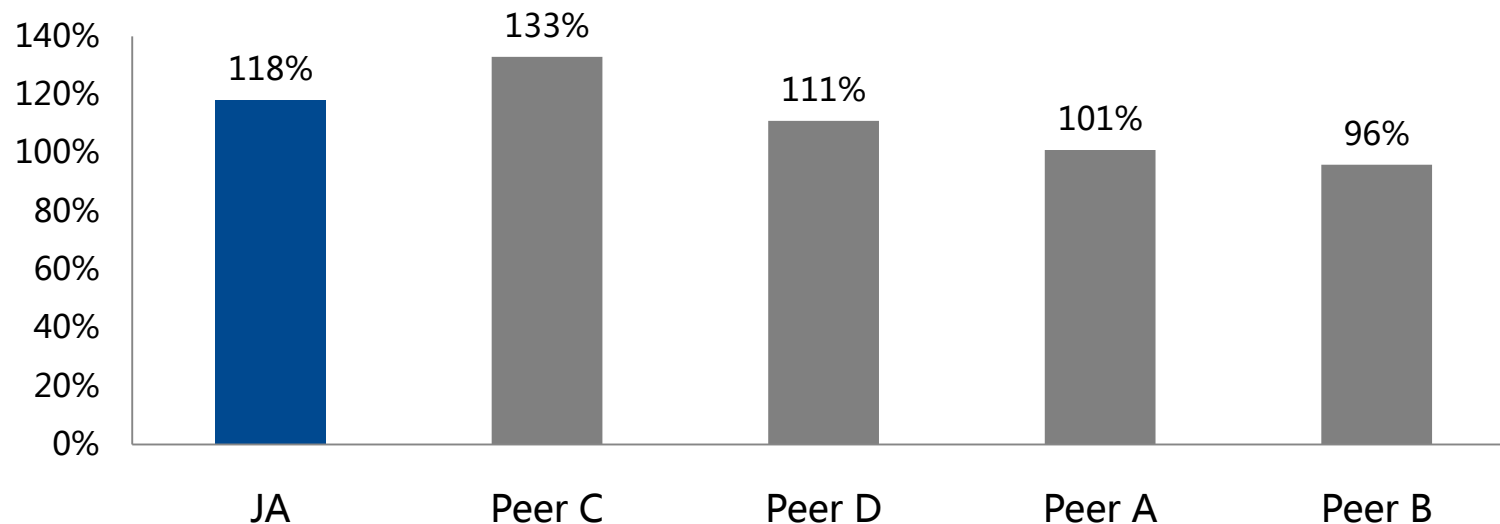
Source: BNEF

Solid Finance for Future Growth

Debt Ratio

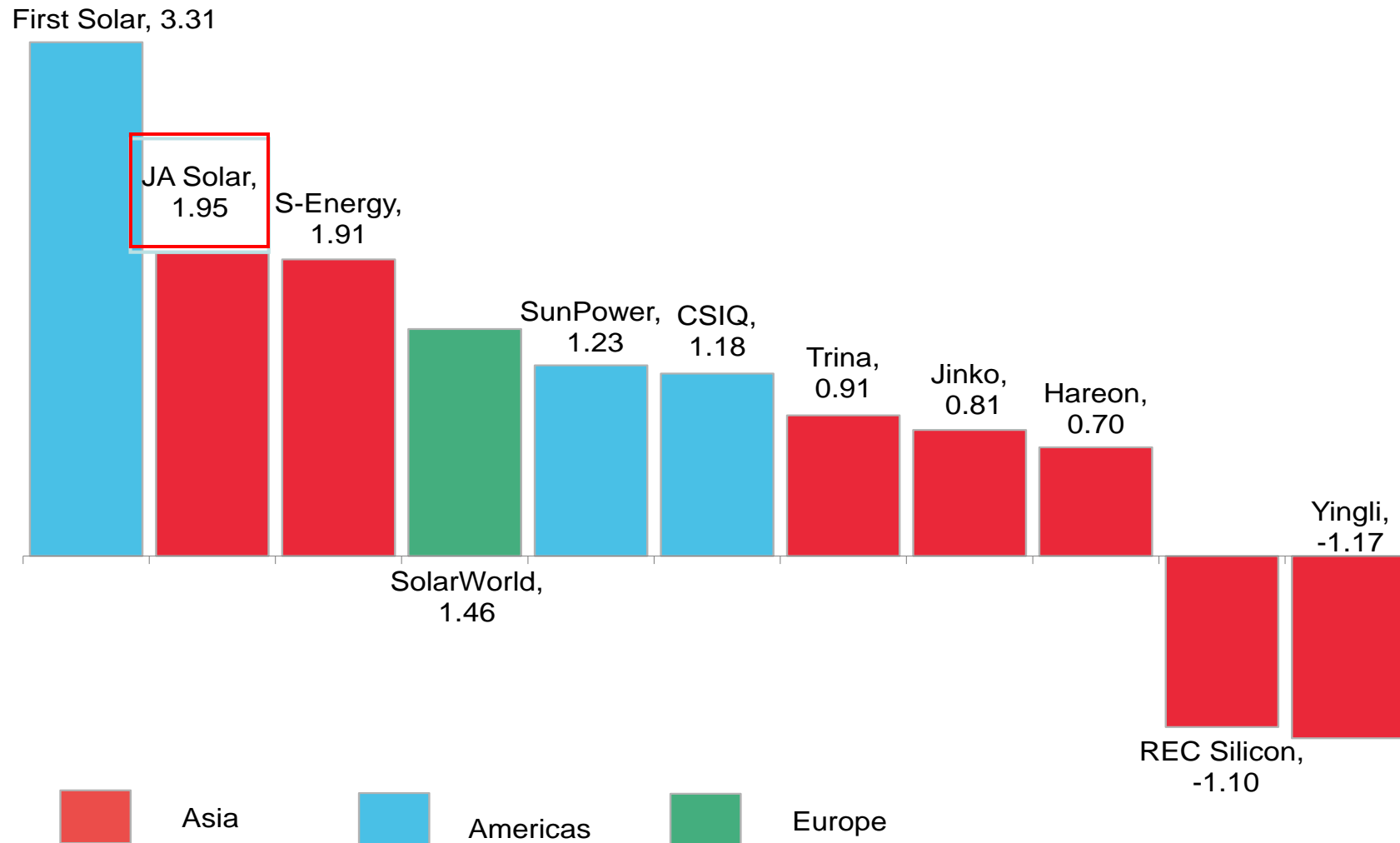


Current Ratio



Solid Finance for Future Growth

—Altman-Z scores of pureplay solar companies



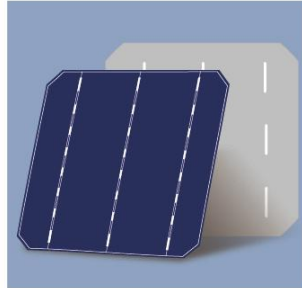
Optimized Vertically Integrated



Polysilicon



Silicon Wafer
2.5 GW



Cell
5.5 GW



Module
5.5 GW



System

JA SOLAR

State-of-The-Art Production Facilities



Global Market Coverage

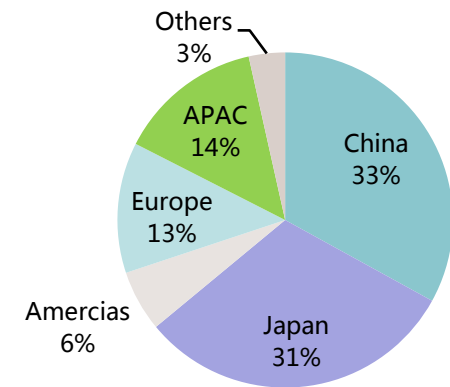
—A global sales network over 90 countries



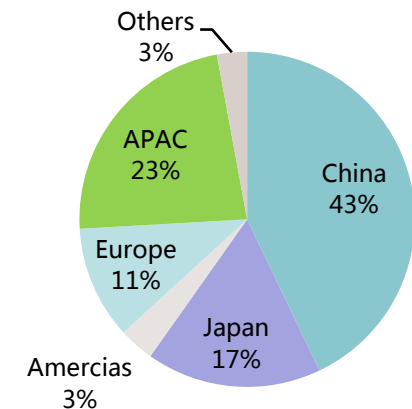
External shipments by region

(% of total MW shipped)

2014



2015



Top Brand PV Modules 2016 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

38.7 MW



100MW project in Dunhuang, China Bank: ICBC (Industrial and Commercial Bank of China)

Dunhuang, 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

TSE 30MW in Kanchanaburi Bank: Bangkok Bank

Kanchanaburi, Thailand

30 MW



30MW Project in Japan

Tomakomai, Japan

30 MW



Largest Solar Installation in Israel,

Arava Desert and Negev Desert, Israel

35 MW



Largest Solar Installation in North Africa

Kenitra, Morocco

2 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



Harvest the Sunshine
Premium Cells, Premium Modules

Thank you !

JASOLAR

December 5, 2016