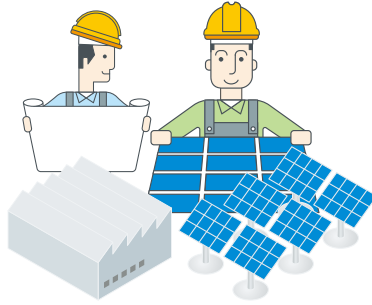




**SHINSUNG  
E&G**



# Key to success



- **High efficiency**

Shinsung E&G guarantees the highest output through mass production of high efficiency products such as photovoltaic technology recognized by the world, solar cells with more than 20% efficiency and modules with more than 16% efficiency

- **Stable construction**

Shinsung E&G establishes production equipment in a perfect and rapid manner from equipment order, installation to mass production setting for new photovoltaic business operators, providing a stable production line, and guarantees high output based on the construction of high efficiency power plants for plant operators.

- **Follow-up management**

Shinsung E&G establishes round-the-clock service support system to minimize problems for customers and realizes customer satisfaction with before sales and after-sales services.

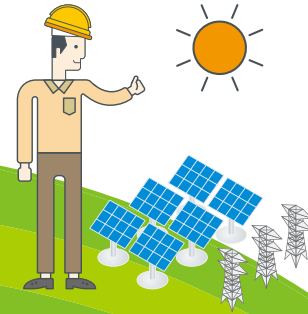
- **Technology support**

Shinsung E&G's photovoltaic experts provide knowhow on mass production technology of high efficiency solar cells and modules and offer education on photovoltaic power plants management through one to one technology training support with customer's technicians.

# Our Work



# Solar System



## One - Stop Solution



High-efficiency solar cell



High-output modules



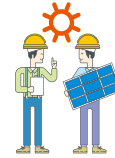
Meticulous consulting



Organized system design



Material procurement



Perfect construction



Cooperation support among subsidiaries



Reliable after-sales service

## Everything about photovoltaic power generation

Consulting – Engineering – Construction – O&M (Operations & Maintenance) Solar panels convert sunlight into electricity. The electricity generated from solar system is used for home appliances, lights, and devices through an inverter and your electrical panel.

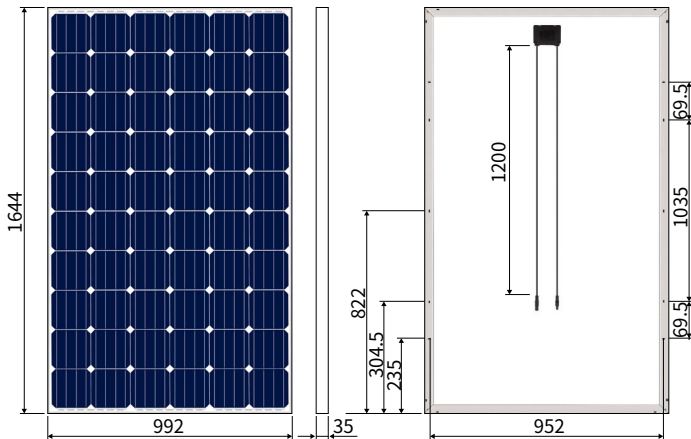
Shinsung E&G provides one of the most efficient solar systems based on its technical knowledge about the core components of solar cells and modules.



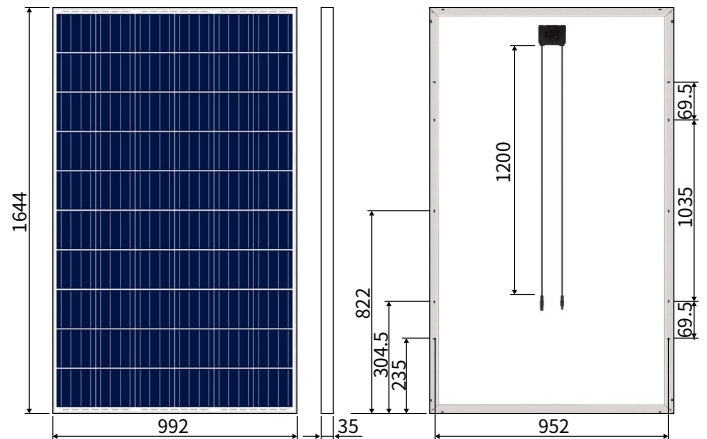


# High Efficiency, High Performance, **60** Cells

## MONO



## MULTI



Item	SS-BM280	SS-BM285	SS-BM290
Peak Power(Wp)	280	285	290
Open Circuit Voltage(V)	39.77	39.84	39.96
Short Circuit Current(A)	9.53	9.65	9.76
Voltage at Pmax(V)	30.84	31.05	31.32
Current at Pmax(A)	9.08	9.18	9.26
Efficiency(%)	17.17	17.48	17.78
Dimension(mm)	992 X 1,644 X 35		
Weight(Kg)	18.4 ±0.1		

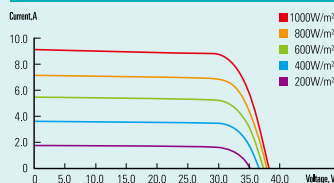
※ All data is tested under STC(Standard Test Conditions). Above data may be changed without prior notice.

- Peak power tolerance 0 ~ +3.0%

### Temperature Coefficient (Cell)

NOCT	45 ±3(°C)
$\alpha \Delta$ ISC	0.0480(%/degree)
$\beta \Delta$ VOC	- 0.3070(%/degree)
$\gamma \Delta$ Pmax	- 0.3800(%/degree)

### I-V Curve



Item	SS-BP260	SS-BP265	SS-BP270
Peak Power(Wp)	260	265	270
Open Circuit Voltage(V)	37.70	38.00	38.30
Short Circuit Current(A)	9.03	9.09	9.16
Voltage at Pmax(V)	30.60	30.90	31.20
Current at Pmax(A)	8.51	8.58	8.66
Efficiency(%)	15.94	16.25	16.56
Dimension(mm)	992 X 1,644 X 35		
Weight(Kg)	18.4 ±0.1		

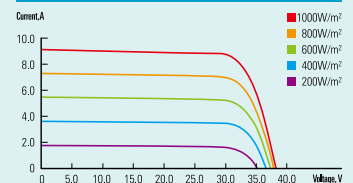
※ All data is tested under STC(Standard Test Conditions). Above data may be changed without prior notice.

- Peak power tolerance 0 ~ +3.0%

### Temperature Coefficient (Cell)

NOCT	45 ±3(°C)
$\alpha \Delta$ ISC	0.0490(%/degree)
$\beta \Delta$ VOC	- 0.3330(%/degree)
$\gamma \Delta$ Pmax	- 0.4200(%/degree)

### I-V Curve



### Mechanical Characteristics

Solar Cells	156.75 x 156.75mm
Front Glass	Low Iron Tempered Glass
Junction Box	JM13D: IP67 / 3Bypass Diode
Output Cable	4mm² Cable, MC 4(Compatible) Type
Frame	AL Alloy Type(Anodized)

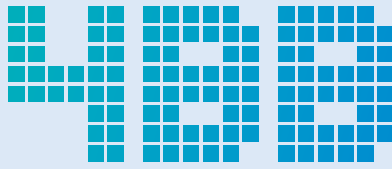
### Tested Operation Conditions

Max Load	Mono: 550kgf/m²(5400Pa) Multi: 734kgf/m²(7200Pa)
Impact Resistance	25mm, 23m/s
Operating emperature	-40 ~ +85°C
System Voltage	1,000V

### Safety Ratings & Warranties

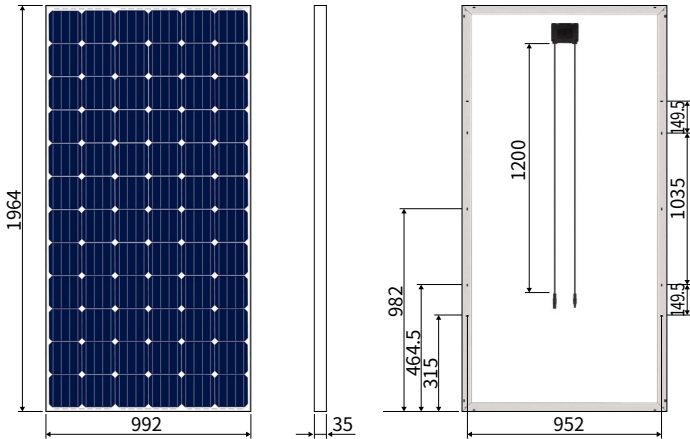
Fire Safety Classification	Class "C"
Salt-mist Corrosion Test	Tested
Visible Light Reflected	Mono (~ 5.00%), Multi(~ 5.00%) For more information, please contact us.
Warranty	10 Years limited Product Warranty 10 Years limited Power Warranty : 90% 25 Years limited Power Warranty : 80%
Certifications	IEC 61215, IEC 61730



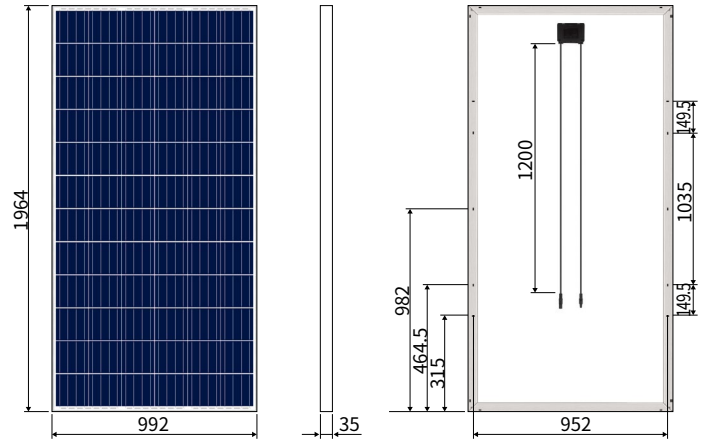


# High Efficiency, High Performance, 72 Cells

## MONO



## MULTI



Item	SS-DM340	SS-DM345	SS-DM350
Peak Power(Wp)	340	345	350
Open Circuit Voltage(V)	47.78	47.88	47.98
Short Circuit Current(A)	9.63	9.71	9.79
Voltage at Pmax(V)	37.36	37.50	37.64
Current at Pmax(A)	9.11	9.20	9.30
Efficiency(%)	17.45	17.71	17.96
Dimension(mm)	992 X 1,964 X 35		
Weight(Kg)	21.6 ± 0.1		

※ All data is tested under STC(Standard Test Conditions). Above data may be changed without prior notice.

- Peak power tolerance 0 ~ +3.0%

Item	SS-DP310	SS-DP315	SS-DP320	SS-DP325
Peak Power(Wp)	310	315	320	325
Open Circuit Voltage(V)	45.10	45.40	45.50	45.60
Short Circuit Current(A)	9.01	9.08	9.10	9.11
Voltage at Pmax(V)	36.60	37.00	37.50	38.00
Current at Pmax(A)	8.48	8.53	8.55	8.57
Efficiency(%)	15.91	16.17	16.42	16.68
Dimension(mm)	992 X 1,964 X 35			
Weight(Kg)	21.6 ± 0.1			

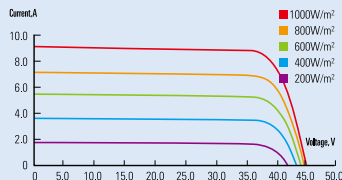
※ All data is tested under STC(Standard Test Conditions). Above data may be changed without prior notice.

- Peak power tolerance 0 ~ +3.0%

### Temperature Coefficient (Cell)

NOCT	45 ± 3(°C)
$\alpha \Delta$ ISC	0.0480(%/degree)
$\beta \Delta$ VOC	- 0.3070(%/degree)
$\gamma \Delta$ Pmax	- 0.3800(%/degree)

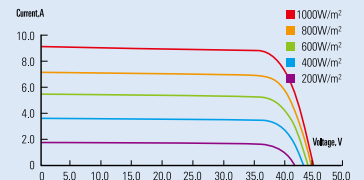
### I-V Curve



### Temperature Coefficient (Cell)

NOCT	45 ± 3(°C)
$\alpha \Delta$ ISC	0.0490(%/degree)
$\beta \Delta$ VOC	- 0.3330(%/degree)
$\gamma \Delta$ Pmax	- 0.4200(%/degree)

### I-V Curve



### Mechanical Characteristics

Solar Cells	156.75 x 156.75mm
Front Glass	Low Iron Tempered Glass
Junction Box	JM13D: IP67 / 3Bypass Diode
Output Cable	4mm² Cable, MC 4(Compatible) Type
Frame	AL Alloy Type(Anodized)

### Tested Operation Conditions

Max Load	Mono: 550kgf/m²(5400Pa) Multi: 734kgf/m²(7200Pa)
Impact Resistance	25mm, 23m/s
Operating emperature	-40 ~ +85°C
System Voltage	1,000V

### Safety Ratings & Warranties

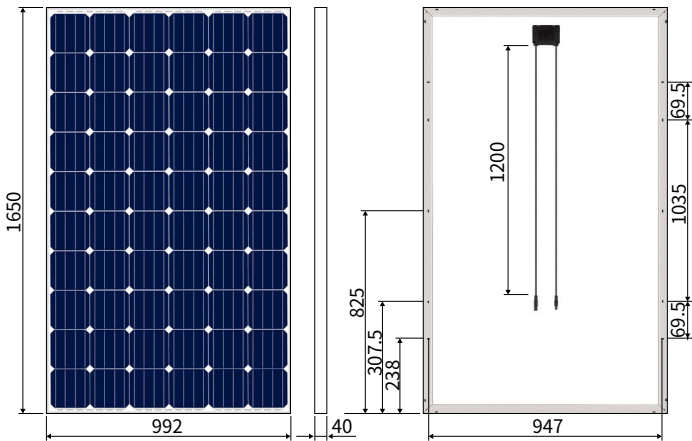
Fire Safety Classification	Class "C"
Salt-mist Corrosion Test	Tested
Visible Light Reflected	Mono (~ 5.00%), Multi(~ 5.00%) For more information, please contact us.
Warranty	10 Years limited Product Warranty 10 Years limited Power Warranty : 90% 25 Years limited Power Warranty : 80%
Certifications	IEC 61215, IEC 61730



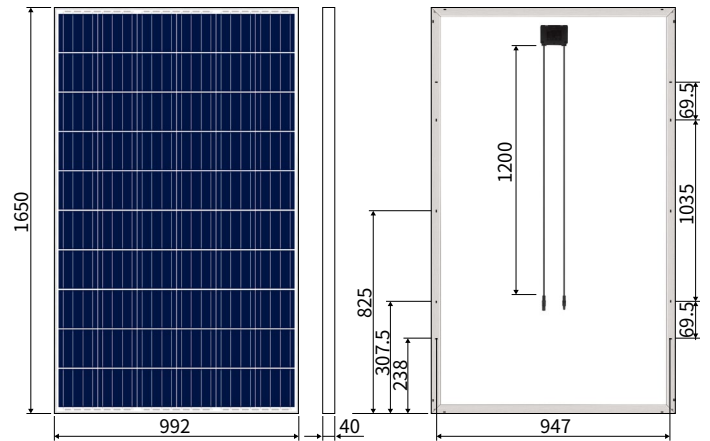


# High Efficiency, High Performance, 60 Cells

## MONO



## MULTI



Item	SS-BM280	SS-BM285	SS-BM290
Peak Power(Wp)	280	285	290
Open Circuit Voltage(V)	39.77	39.84	39.96
Short Circuit Current(A)	9.53	9.65	9.76
Voltage at Pmax(V)	30.84	31.05	31.32
Current at Pmax(A)	9.08	9.18	9.26
Efficiency(%)	17.17	17.48	17.78
Dimension(mm)	992 X 1,650 X 40		
Weight(Kg)	18.8 ± 0.2		

※ All data is tested under STC(Standard Test Conditions). Above data may be changed without prior notice.

- Peak power tolerance 0 ~ +3.0%

Item	SS-BP260	SS-BP265	SS-BP270
Peak Power(Wp)	260	265	270
Open Circuit Voltage(V)	37.70	38.00	38.30
Short Circuit Current(A)	9.03	9.09	9.16
Voltage at Pmax(V)	30.60	30.90	31.20
Current at Pmax(A)	8.51	8.58	8.66
Efficiency(%)	15.94	16.25	16.56
Dimension(mm)	992 x 1,650 x 40		
Weight(Kg)	18.8 ± 0.2		

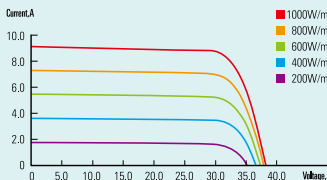
※ All data is tested under STC(Standard Test Conditions). Above data may be changed without prior notice.

- Peak power tolerance 0 ~ +3.0%

### Temperature Coefficient (Cell)

NOCT	45 ± 3(°C)
$\alpha \Delta$ ISC	0.0480(%/degree)
$\beta \Delta$ VOC	- 0.3070(%/degree)
$\gamma \Delta$ Pmax	- 0.3800(%/degree)

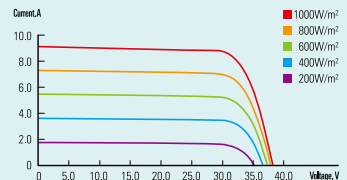
### I-V Curve



### Temperature Coefficient (Cell)

NOCT	45 ± 3(°C)
$\alpha \Delta$ ISC	0.0530(%/degree)
$\beta \Delta$ VOC	- 0.3210(%/degree)
$\gamma \Delta$ Pmax	- 0.3900(%/degree)

### I-V Curve

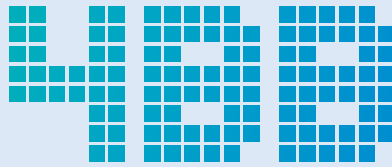


Mechanical Characteristics	
Solar Cells	156.75 x 156.75mm
Front Glass	Low Iron Tempered Glass
Junction Box	JM13B: IP67 / 3Bypass Diode & Smart J/Box
Output Cable	4mm² Cable, MC 4(Compatible) Type
Frame	AL Alloy Type(Anodized)

Tested Operation Conditions	
Max Load	40 lbs / ft2
Impact Resistance	25mm, 23m/s
Operating emperature	-40 ~ +85°C
System Voltage	1,500V (Smart J/Box: 1000V)

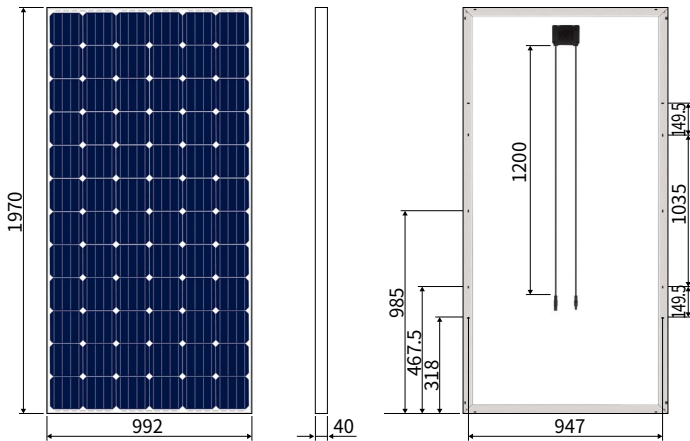
Safety Ratings & Warranties	
Fire Safety Classification	Type 1
Salt-mist Corrosion Test	Tested
Visible Light Reflected	Mono (~ 5.00%), Multi(~ 5.00%) For more information, please contact us.
Warranty	10 Years limited Product Warranty 10 Years limited Power Warranty : 90% 25 Years limited Power Warranty : 80%
Certifications	UL1703



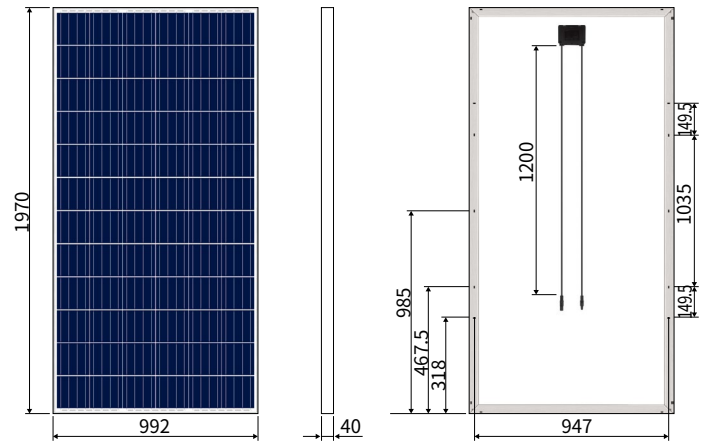


# High Efficiency, High Performance, **72** Cells

## MONO



## MULTI



Item	SS-DM340	SS-DM345	SS-DM350
Peak Power(Wp)	340	345	350
Open Circuit Voltage(V)	47.78	47.88	47.98
Short Circuit Current(A)	9.63	9.71	9.79
Voltage at Pmax(V)	37.36	37.50	37.64
Current at Pmax(A)	9.11	9.20	9.30
Efficiency(%)	17.45	17.71	17.96
Dimension(mm)	992 X 1,970 X 40		
Weight(Kg)	21.8±0.2		

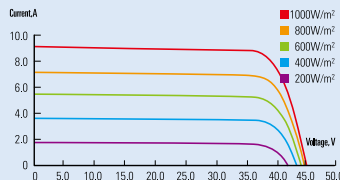
※ All data is tested under STC(Standard Test Conditions). Above data may be changed without prior notice.

- Peak power tolerance 0 ~ +3.0%

### Temperature Coefficient (Cell)

NOCT	45 ±3(°C)
$\alpha \Delta$ ISC	0.0480(%/degree)
$\beta \Delta$ VOC	- 0.3070(%/degree)
$\gamma \Delta$ Pmax	- 0.3800(%/degree)

### I-V Curve



Item	SS-DP310	SS-DP315	SS-DP320
Peak Power(Wp)	310	315	320
Open Circuit Voltage(V)	45.10	45.40	45.50
Short Circuit Current(A)	9.01	9.08	9.10
Voltage at Pmax(V)	36.60	37.00	37.50
Current at Pmax(A)	8.48	8.53	8.55
Efficiency(%)	15.91	16.17	16.42
Dimension(mm)	992 X 1,970 X 40		
Weight(Kg)	21.8±0.2		

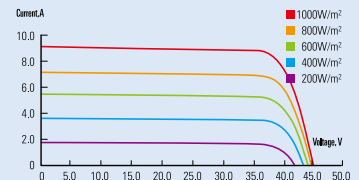
※ All data is tested under STC(Standard Test Conditions). Above data may be changed without prior notice.

- Peak power tolerance 0 ~ +3.0%

### Temperature Coefficient (Cell)

NOCT	45 ±3(°C)
$\alpha \Delta$ ISC	0.0530(%/degree)
$\beta \Delta$ VOC	- 0.3210(%/degree)
$\gamma \Delta$ Pmax	- 0.3900(%/degree)

### I-V Curve



### Mechanical Characteristics

Solar Cells	156.75 x 156.75mm
Front Glass	Low Iron Tempered Glass
Junction Box	JM13B: IP67 / 3Bypass Diode & Smart J/Box
Output Cable	4mm² Cable, MC 4(Compatible) Type
Frame	AL Alloy Type(Anodized)

### Tested Operation Conditions

Max Load	40 lbs / ft2
Impact Resistance	25mm, 23m/s
Operating emperature	-40 ~ +85°C
System Voltage	1,500V (Smart J/Box: 1000V)

### Safety Ratings & Warranties

Fire Safety Classification	Type 1
Salt-mist Corrosion Test	Tested
Visible Light Reflected	Mono (~ 5.00%), Multi(~ 5.00%) For more information, please contact us.
Warranty	10 Years limited Product Warranty 10 Years limited Power Warranty : 90% 25 Years limited Power Warranty : 80%
Certifications	UL1703



# Shinsung E&G

conversion efficiency rate for solar cell in our research center. Currently, Shinsung E&G is producing above 20% efficiency solar cells and successfully established 'solar cell→module→installation' model, improving its own competitiveness in the global solar market. Under the objectives of preserving the environment and helping the advancement of solar energy business, Shinsung E&G will continue to put our best efforts.

has started PV business, the key field of renewable energy since 2007, and it will secure 600MW solar cell annual capacity at Jeungpyeong and 200MW solar module annual capacity at Eumseong by the end of 2016. Shinsung achieved 20.29%

## History

### 1977

- Establishment of Shinsung Industry

### 1991

- Awarded with Iron Tower Order of Industrial Service Merit

### 1998

- Received 10 Million Dollars Exporting Award

### 2005

- Awarded with Gold Tower Order of Industrial Service Merit

### 2007

- **Launching solar cell business**

### 2008

- Split of Shinsung into three independent companies
- Shinsung Holdings, Shinsung ENG and Shinsung FA
- Change listing and resume listing on the stock market

### 2009

- Opened Solar Energy Promotion Center
- Achieved ISO 9001, ISO 14001, IEC 61215, IEC 61730

### 2010

- **Developed the world's first 19.6% in solar energy conversion efficiency of solar cell**
- Received 30 Million Dollars Exporting Award
- Received Prime Minister Commendation
- Received the President Commendation in Outstanding Job Creating Company

### 2011

- **Changed the company name to Shinsung Solar Energy**
- Expansion of solar cell line (total 350MW)
- Entered module industry (total 150MW)
- Established 'solar cell → module → installation' system
- Received the top Korean certification in 250W, 255W and 260W module efficiency

### 2012

- Achieved research performance of 20.03% for energy conversion efficiency in solar cells
- Launched solar energy EPC business
- Certified to OHSAS 18001

### 2013

- Registered Program-CDM Business with the UN
- Received 0% in efficiency reduction ratio of PID test
- Program CDM business registered by UN
- Achieved 0% of efficiency reduction on PID test

### 2014

- '50 Million-dollar Export Tower' Award

### 2015

- '100 Million-dollar Export Tower' Award

### 2016

- Achieved research performance of 20.29% for energy conversion efficiency in solar cells
- Improving production lines by the end of 2016 (Solar cells:600MW, Modules:200MW)
- **Shinsung Solar Energy affiliated with ShinsungENG, ShinsungFA**

### 2017

- **Changed the company name to Shinsung E&G Co.,Ltd**