



# **STATUS ON CHINA'S NEW ENERGY INDUSTRY**

China New Energy Chamber of Commerce

CNECC

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# 1. General Situation about China's New Energy Industry



## Status in 2011

- ◆ Solar PV: newly installation capacity is 2.2GW and ranks No. 3 in the world.
- ◆ Solar water heater: total capacity and inventory are respectively 57,600,000 m<sup>2</sup> and 217,400,000m<sup>2</sup>, ranks No. 1 in the world.
- ◆ Wind power: Newly installation capacity is 18GW, ranks No.1 in the world and accounting for 44% of the whole.
- ◆ Biomass generator installation capacity is 5.5GW.
- ◆ Geothermal energy: cumulative generator installation capacity is 2.42GW
- ◆ Ocean energy: cumulative generator installation capacity is 6MW.

# 1. General Situation about China's New Energy Industry



## Target in 2015

- ◆ installed capacity for solar power will reach 21GW ;
- ◆ Installation base for solar water heaters will reach 0.4 billion m<sup>2</sup> ;
- ◆ installed capacity for wind power will reach 0.1 billion KW ;
- ◆ installed capacity for biomass will reach 13 million KW ;
- ◆ installed capacity for geothermal power will reach 100,000 KW ;
- ◆ installed capacity for ocean power will reach 50,000 KW.

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## General Situation about China's New Energy Industry

1.1 Overview about China's Solar PV Industry

1.2 Status on China's Solar Thermal Utilization Industry

1.3 Status on China's Wind Power Industry

1.4 Status on China's Biomass Energy Industry

## 1. 1 Overview about China's Solar PV Industry

The “12th Five-year Plan for Renewable Energy” initiated by State Energy Administration is not uncovered now, but the opinion collection paper pointed out clearly that:

Solar generator installation capacity will be reach 21GW by 2015 (including 1GW for CSP)

50GW by 2020(including 10GW for CSP)

Conservative prediction is 3-5GW for annual newly installation capacity

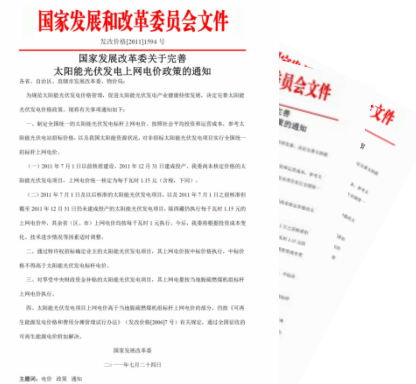
# 1. 1 Overview about China's Solar PV Industry

July 24, 2011, NDRC released The Notice by NDRC for Improving Solar PV FIT Price Scheme

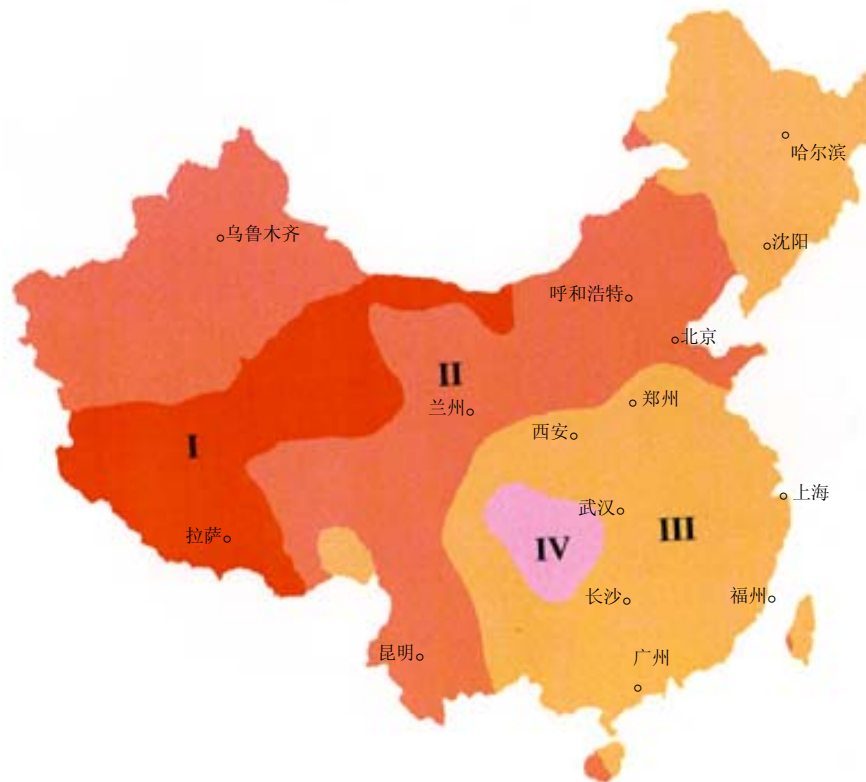
(1) The projects that being construction could enjoy the price of 1.15yuan/kW · h if they have got the approval before July 1st and would be completed before the end of the 2011.

(2) New projects enjoy 1yuan/kW · h except ones in Tibet. The price is expected to be lower and Tibet area will maintain the price of 1.15yuan/kW · h

(3) The part of PV electricity price which exceeds the benchmark of coal fire power price will be supported by the national-wild policy of “Renewable Energy Electricity Price Addition”



## 1. 1 Overview about China's Solar PV Industry



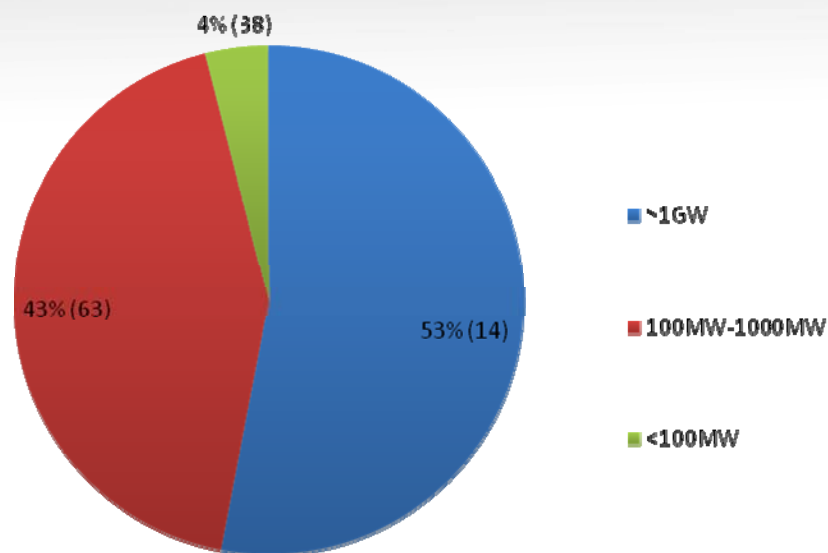
Solar Energy Resources :

With more than 2,200 hours of  
sunshine annually in 2/3  
land area

Rich sunshine in western area  
of China



# 1. 1 Overview about China's Solar PV Industry



*China's solar cells enterprises production capacity layout map*

	2011	2012E	capacity expansion
Hareon	900	1700	800
Yingli	1700	2450	750
Canadian	1300	2000	700
Trina	1900	2400	500
CEEG	600	1000	400
Tianwei	600	1000	400
EGing	600	1000	400
Tenghui	700	1000	300
Jasolar	2770	2770	-
Suntech	2400	2400	-
Ldk	2000	2000	-
Hanwha	1300	1300	-
Jinko	1200	1200	-
<b>Total</b>	<b>17,970</b>	<b>22,220</b>	<b>4,250</b>

資料來源：公司資料，弘亞世代，華泰聯合證券研究所

*The part of China's solar cells enterprises production capacity*

By the end of 2011, China's solar cells enterprises are 115 and the total production capacity is 37GW, accounting for 70% of the whole. The intensity of large-scale factories will keep increasing in 2012.

## 1. 1 Overview about China's Solar PV Industry

In 2011, the solar cells output of China's mainland reached 23GW, being No.1 in the world for 6 years.

Year	2004	2005	2006	2007	2008	2009	2010	2011
Production (MW)	50	200	400	1088	2600	4011	13000	23000
Installation (MW)	10	5	10	20	40	160	500	2200
Export (MW)	40	195	390	1068	2560	3851	12500	20800
Export Rate (%)	80.0	97.5	97.5	98.2	98.5	96.0	96.2	90.4

Although China made a great achievement in the field of solar PV installation, the dependency on exporting is still high. In order to reduce the industry risk, the crying needs is to start domestic market on a large scale for solar PV power generation

## 1. 1 Overview about China's Solar PV Industry

### 2011 Domestic PV Enterprises' Solar Cells & Modules Shipment Ranking

Enterprise	Suntech	JA Solar	Yingli Group	Trina Solar	Canadian Solar	Hareon Solar	Hanwha	Jinko Solar	LDK	EGing PV
Shipment	2096	1680	1604	1512	1323	970	820	816	600	550

## 1. 1 Overview about China's Solar PV Industry

The Price of Spot PV Products in Nov.26,

Products	Price	Weekly Raise	Monthly Raise
Original Polysilicon	17.7\$/kg	0.14%	-0.73%
156 Polysilicon Slice	0.2\$/W	0.14%	-16.12%
156 Polysilicon Cells	0.25\$/W	-0.77%	-22.41%
Modules	0.49\$/W	-0.79%	-19.33%

*Source : China New Energy Chamber of Commerce and Huatai United Securities*

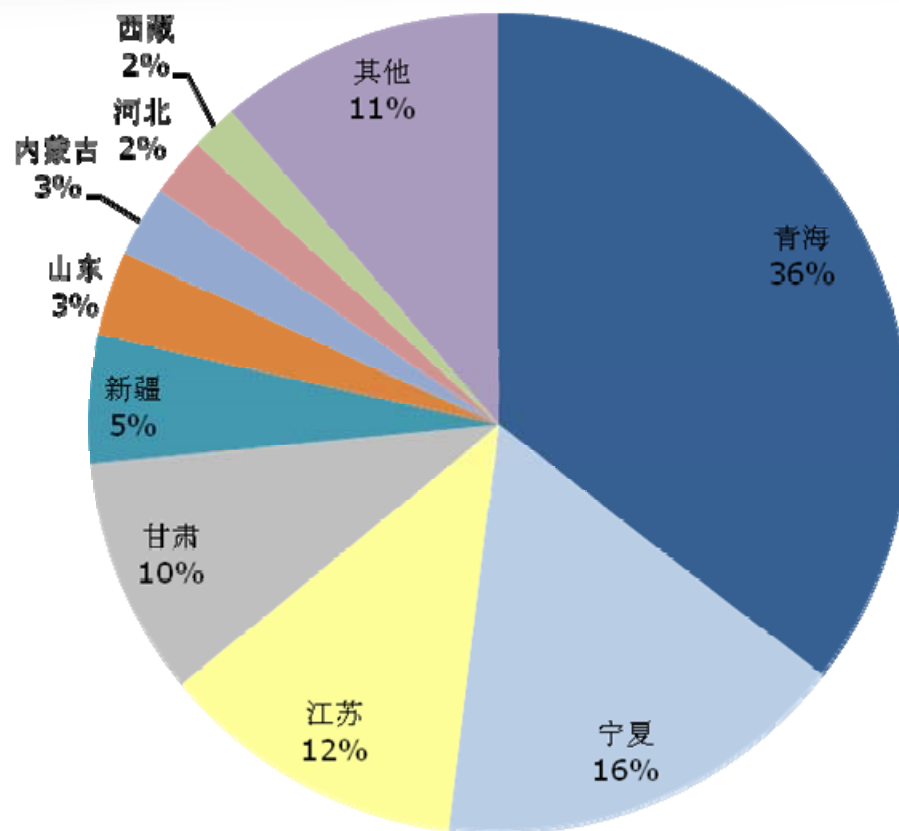
## 1. 1 Overview about China's Solar PV Industry

### Annual Capacity(2004-2011)

Year	2004	2005	2006	2007	2008	2009	2010	2011
Off-grid (MW)	8.8	7.4	9	17.8	19	18	25	20
On-grid (MW)	1.2	1.5	1	2.2	21	142	475	2180
Annual Capacity (MW)	10	7.9	10	20	40	160	500	2200
Culmulative Capacity (MW)	62.1	70	80	100	140	300	800	3000

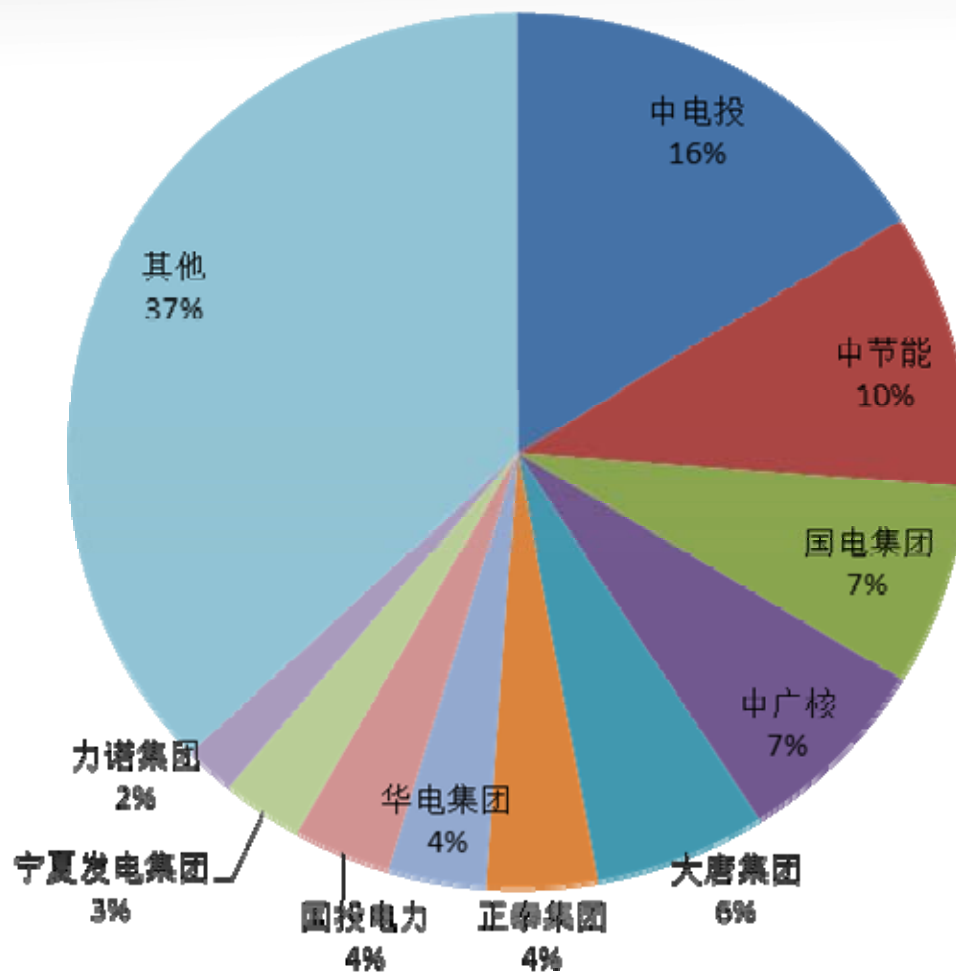
## 1.1 Overview about China's Solar PV Industry

2011 PV New Installations (Province)



## 1.1 Overview about China's Solar PV Industry

### 2011 Market Concentration of PV Projects Developers



## 1.1 Overview about China's Solar PV Industry

Upper Yellow River Company's Golmud 200MW On-grid PV Power Station



On 14: 58 pm, Oct. 29, 2011, Golmud 200 MW Solar Power Plants Enters into on-grid adjustment & testing and trial run period.



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## 1.2 Status on China's Solar Thermal Utilization Industry

China's solar water heaters industry is the national industry that own intellectual property rights, and basically realize industrialization in renewable energy field.

China gradually becomes main production and use nation after 1990; the annual output reached 57.6 million units, which accounts for 80% of the world annual output. The installation base reached 217 million units in 2011, which accounts for about 80% of world ones.



vacuum tube solar water heaters



Flat glass solar water heaters

## 1.2 Status on China's Solar Thermal Utilization Industry



The annual output and installation base of solar water heaters during 1998~2011

Year	Total Output		Increase over Last Year (%)	Installation Base		Increase over Last Year (%)
	10,000—	MWth		10,000—	MWth	
1998	350	2450	--	1500	10500	--
1999	500	3500	43	2000	14000	33
2000	640	4480	28	2600	18200	30
2001	820	5740	28	3200	22400	23
2002	1000	7000	22	4000	28000	25
2003	1200	8400	20	5000	35000	25
2004	1350	9450	12.50	6200	43400	24
2005	1500	10500	11.10	7500	52500	21
2006	1800	12600	20	9000	63000	20
2007	2300	16100	30	10800	75600	19.4~20
2008	3100	21700	32.50	12500	87500	15.70
2009	4200	29400	35.50	14500	101500	16
2010	4900	34300	16.67	16800	117600	15.86
2011	5760	40320	17.55	21700	151900	29.17

## 1.2 Status on China's Solar Thermal Utilization Industry

Market Development Forecast Table of China's Solar Water Heaters during 2010-2020 (High、Medium、Low Three Programs)

Year	Output (10,000 <sup>2</sup> /MW th)	Growth Rate (%)	Program	Installation Base (10,000 <sup>2</sup> /MW th)	1,000 people own (=1,000 people )	Alternative Coal (10,000 tons )	CO <sub>2</sub> emmission (10,000 tons)
2010	5400/37800	2011-2015: 25% 2016-2020: 10%	Program 1: High Growth 25~ 10%	17300/121100	107.7	2595	5709
2015	16600/116200			47200/330400	339	7080	15576
2020	26800/187600			94800/663600	650	14200	31284
2010	5400/37800	2011-2015: 20% 2016-2020: 15%	Program 2: Medium Growth 20 ~ 15%	17300/121100	107.7	2595	5709
2015	13586/95102			40217/281521	287	6032	12949
2020	27326/191282			81401/569809	649	12949	28487
2010	5400/37800	2011-2015: 20% 2016-2020: 10%	Program 3: Low Growth 20 ~ 10%	17300/121100	107.7	2595	5709
2015	13586/95102			40217/281521	287	6032	12949
2020	21880/153160			67297/471080	542	10094	21669

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## 1.3 Status on China's Wind Power Industry

- ◆ Since August 1, 2009, the benchmark electricity prices of wind power FIT were fixed 0.51、0.54、0.58 and 0.61yuan/kW · h according to cities' administrative boundaries.
- ◆ The plan about 8 kilowatts wind power bases in 7 provinces of Xinjiang(Hami), Gansu(Jiuquan), Inner Mongolia, (divided into east and west), Jilin(west), Hebei, Shandong and Jiangsu.
- ◆ By 2020
- ◆ The total generator installation capacity reaches 0.15bn kW; the output of wind power on-grid electricity is about 300bn kW · h.

### 1.3 Status on China's Wind Power Industry

2011		Newly accumulated		
	Lifting Capacity GW	Building Capacity GW	Operation Capacity GW	Annual on-grid capacity bn kW · h
CWEA	17.63 62.36			
HYDROCHINA	↻2	14.25 52.53		
CEC		↻C	15.46 45.05	73.2

## 1.3 Status on China's Wind Power Industry

CWEA (informal) :

The predicted installation capacity is same to the actual achievement

HYDROCHINA (official) :

Operation capacity is wind turbine capacity which have combined to the grid after debugging.

CEC (power industry) :



## 1.3 Status on China's Wind Power Industry

- ◆ Domestic enterprises have mastered the technology of manufacturing MW-class wind turbine and major components can be produced at home.
- ◆ The output of 2011 was just as 2010, Gold Wind, Sinovel and United Power were all over 2GW and Mingyang was over 1GW. There are nearly 30 manufacturers of overall turbine generator made their products installed in wind power plants.
- ◆ The samples of 3.6MW to 6MW have been applied and some have been in large-scale producing.

## 1.3 Status on China's Wind Power Industry

Off-shore Wind Power  
Our country's off-shore wind power started in 2008, Shanghai Donghai Bridge off-shore wind power plant installed 34 3MW wind turbine generators produced by Sinovel. The total installation capacity is 102MW and was all combined to the grid in June 2010.



Donghai Bridge 102MW offshore wind farm



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## 1.4 Status on China's Biomass Energy Industry

### Resources

Theoretically, the quantity of biomass resource is about 5bn tons standard coal and it is about four times as big as China's total energy consumption

The exploration capacity of crop straw: 0.6 bn tons

The wasted crop straw is about 100 million tons every year

By 2020, China's annual amount of wasted crop straw will be close to 200 million tons

## 1.4 Status on China's Biomass Energy Industry

By 2015 :

Agriculture and forestry biomass power generation: 8GW

Biogas power generation: 2GW

Burned garbage power generation: 3GW

Utilization amount of solid biomass fuel: 10 million tons

Utilization amount of biomass ethanol : 3.5~4 million tons

Utilization amount of biodiesel: 1 million tons

Utilization amount of aviation biomass fuel : 0.1 million tons

## 1.4 Status on China's Biomass Energy Industry

### Relevant Policies

The Notice on Improving Electricity Price of Agriculture and Forestry Biomass Power Generation makes clear that the benchmark on-grid electricity price of biomass power generation is 0.75yuan/kW · h.

During the period of “the 12th Five-year plan” , 200 Green Energy Demonstration Counties will be built.

So far, there are 108 Green Energy Demonstrate Counties has been built in the first round.

The subsidy from central Gov. for each Green Energy Demonstration County should not exceed 25 million yuan in principle. In accordance with the aim of building 200 Green Energy Demonstration Counties, biomass industry will obtain the subsidy of 4.75 bn yuan.

## 1.4 Status on China's Biomass Energy Industry

By the end of 2011

- ◆ Installed biomass capacity: about 5.5GW;
- ◆ Annual usage of biogas: about 13 bn m<sup>3</sup>;
- ◆ Annual usage of biomass briquettes: 0.5 million tons;
- ◆ Annual output of non-grain feedstock for producing fuel ethanol: 0.2 million tons;
- ◆ The amount of fuel ethanol that includes grain produced one: 1.72 million tons;
- ◆ Annual output of biodiesel: about 0.5 million tons.

## 2. The Constraint Condition that China's New Energy Industry Development Faces

- On-grid Ineffective Consumption
- Industry Development Needs to be Regulated
- Lack of Key Technologies
- Cost is on the High Side
- The Pricing Model influences the Development of New Energy



### 3. The Principle of China's New Energy Industry Development

- The Relationship between Economics and Advancement
- The Relationship between Small-scale Distribution and Large-scale Centralization
- The Relationship between Market Mechanism and State Guide
- The Relationship between the Clean Use of Traditional Energy and Renewable Energy Development
- The Relationship between Financial Subsidies and Efficiency

## 4. Suggestions on Promoting New Energy Industry Development

- Forecast Renewable Energy Development Scale Reasonably
- Perfect Renewable Energy Pricing Mechanism
- Deepen Power Structural Reform, Create Favorable Conditions for Renewable Energy Power Generation
- Formulate Fiscal Policies that in favor of Renewable Energy Development and Conform to Efficiency



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Thank you!

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