

REVIEW AND OUTLOOK ON CHINA RENEWABLE ENERGY

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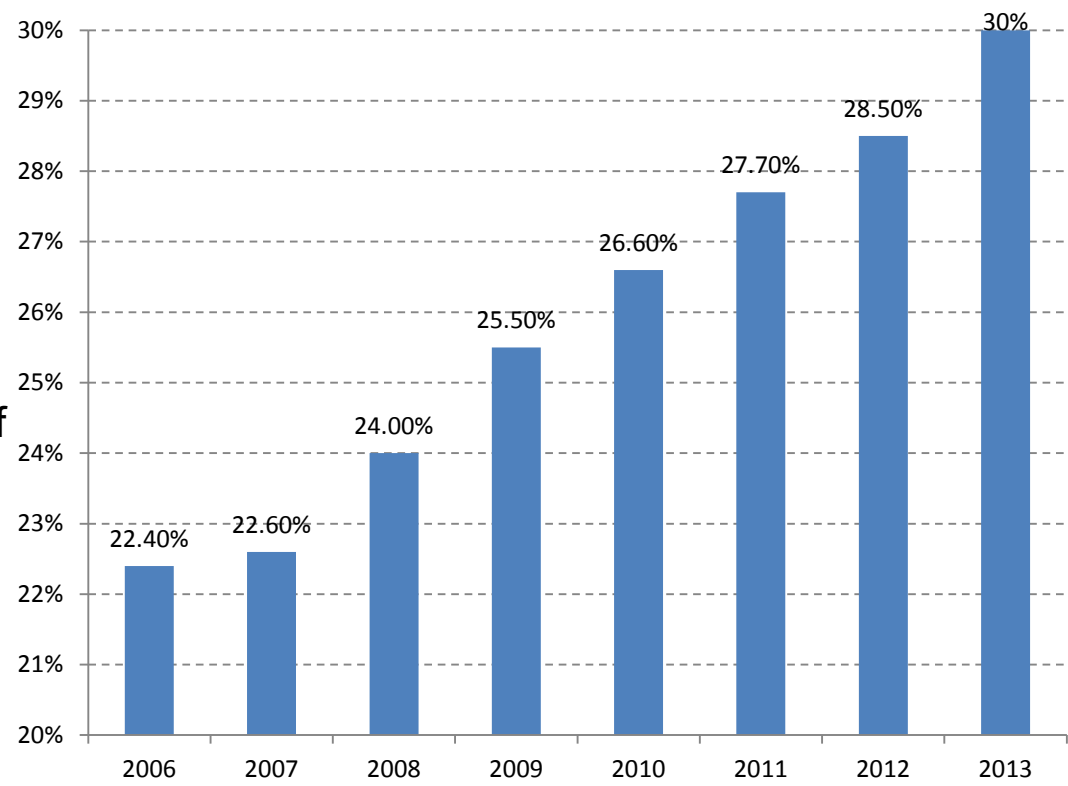
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Chinese Renewable Energy Industries Association

Renewable Energy Market in China

- China's renewable energy market has experienced rapid growth due to continuously **growing demand** and effective **policy support**.
- In 2013, China's renewable power accumulated installed capacity reached **378GW**, accounted for **30%** of total power capacity.
- In 2013, electricity generated by renewables exceeded **1 trillion kwh**, made up **over 20%** of total electric power generated from all sources.

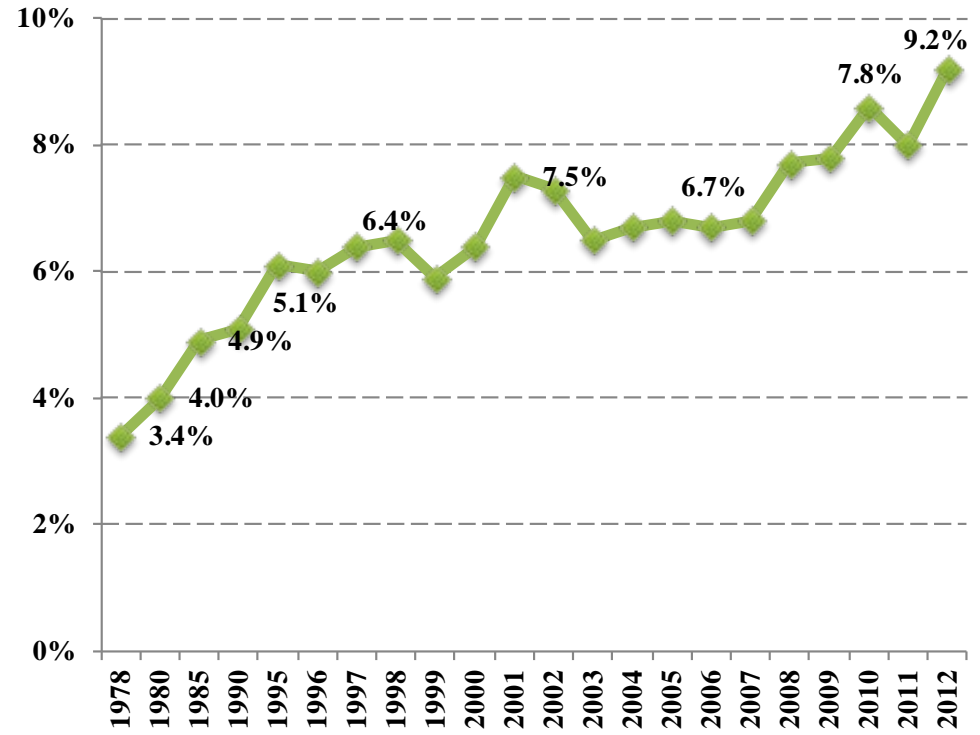
2006-2013 China's renewable energy share of total power installed capacity



Renewable Energy Market in China

- In 2013, renewables made an estimated 9.3% of total primary energy consumption in China.
- In 2013, electric power generated from wind reached 140 billion kwh. From 2012 on, wind overtook nuclear and became China's 3rd largest energy source.

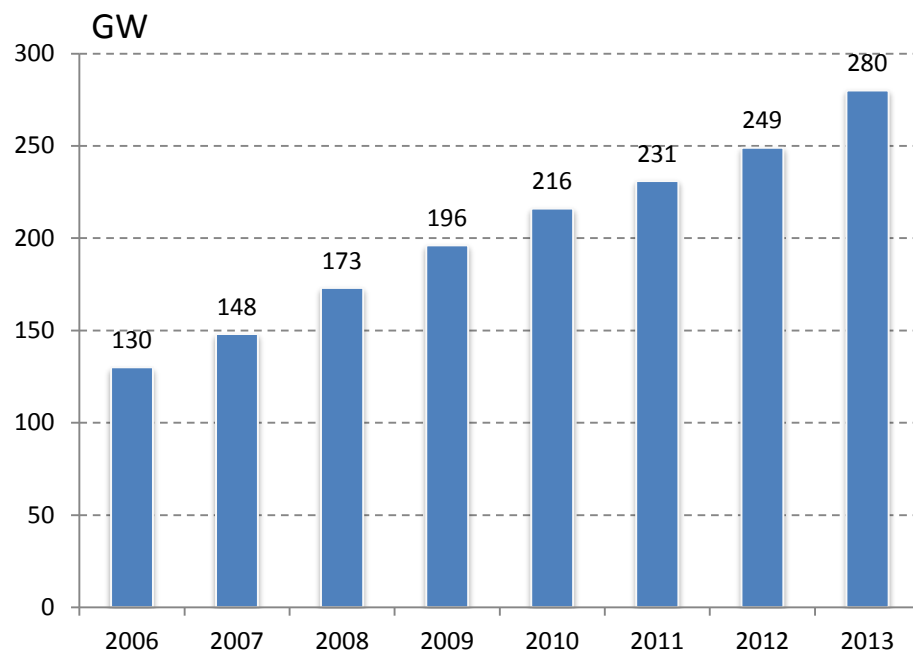
1978-2012 China's non-fossil energy share of total final energy use



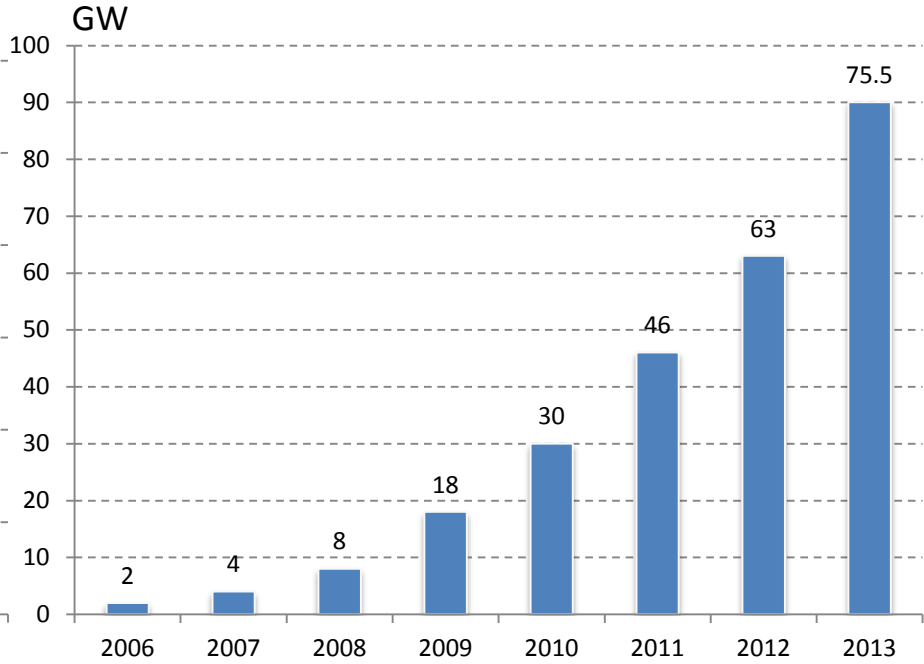
Renewable Energy Market in China

- The accumulated capacity of hydro, wind and solar pv as major renewable power sources are shown in the following charts.

2006-2013 Hydro power accumulated capacity



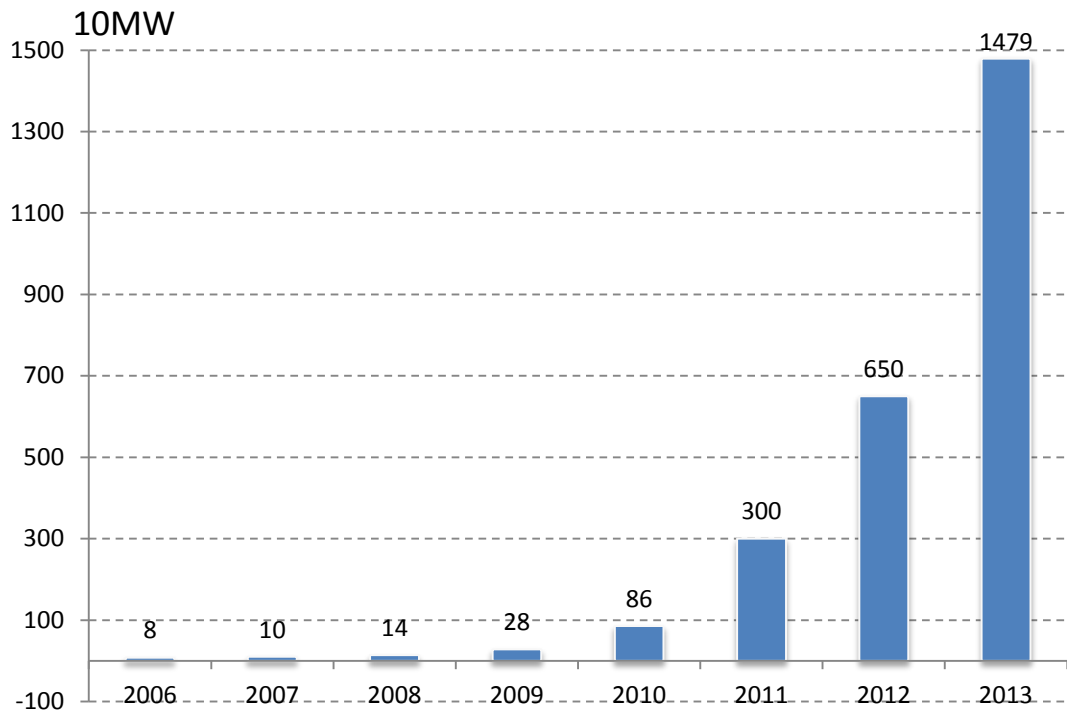
2006-2013 Wind power accumulated capacity



Renewable Energy Market in China

- The accumulated capacity of hydro, wind and solar pv as major renewable power sources are shown in the following charts.

2006-2013 PV power accumulated capacity



Renewable Energy Growth in China

Hydro

- New installed capacity reached **30GW** in 2013.

Wind

- New installed capacity reached **14GW** in 2013.
- The average turbine's operational period increased 151 hours on 2012 to **2,080 hours**, which is a new high since 2005.

Solar PV

- New installed capacity reached **11.3GW** in 2013, including both large-scale and distributed power plants.

CSP

- China's first **10MW** solar thermal power Plant was connected to the grid in Qinghai province.

Policy Instruments: Chinese government has determined to optimize its energy mix with high share of renewables. A series of policy instruments have been taken into place to support such transition.

Renewable Energy Surcharge

- 0.015 Yuan (0.25 U.S. cent) per kwh.
- The surcharge pays for the China Renewable Energy Development Fund, which goes to subsidies to developers of renewable-energy projects.

Wind

- Classified FiT rates in the range of CNY 0.51-0.61(\$0.08-0.10)/kWh for 4 areas.

Solar PV

- Large, transmission grid connected PV projects :Classified rates CNY0.90, 0.95, 1.00 (\$0.15-0.16)/kWh for 3 areas.
- Distributed PV projects: CNY0.42(\$0.07)/kWh generated, plus coal-fire power price which is around CNY0.20 - 0.36(\$0.03 – 0.06)/kWh if surplus electricity feeds back to the grid.

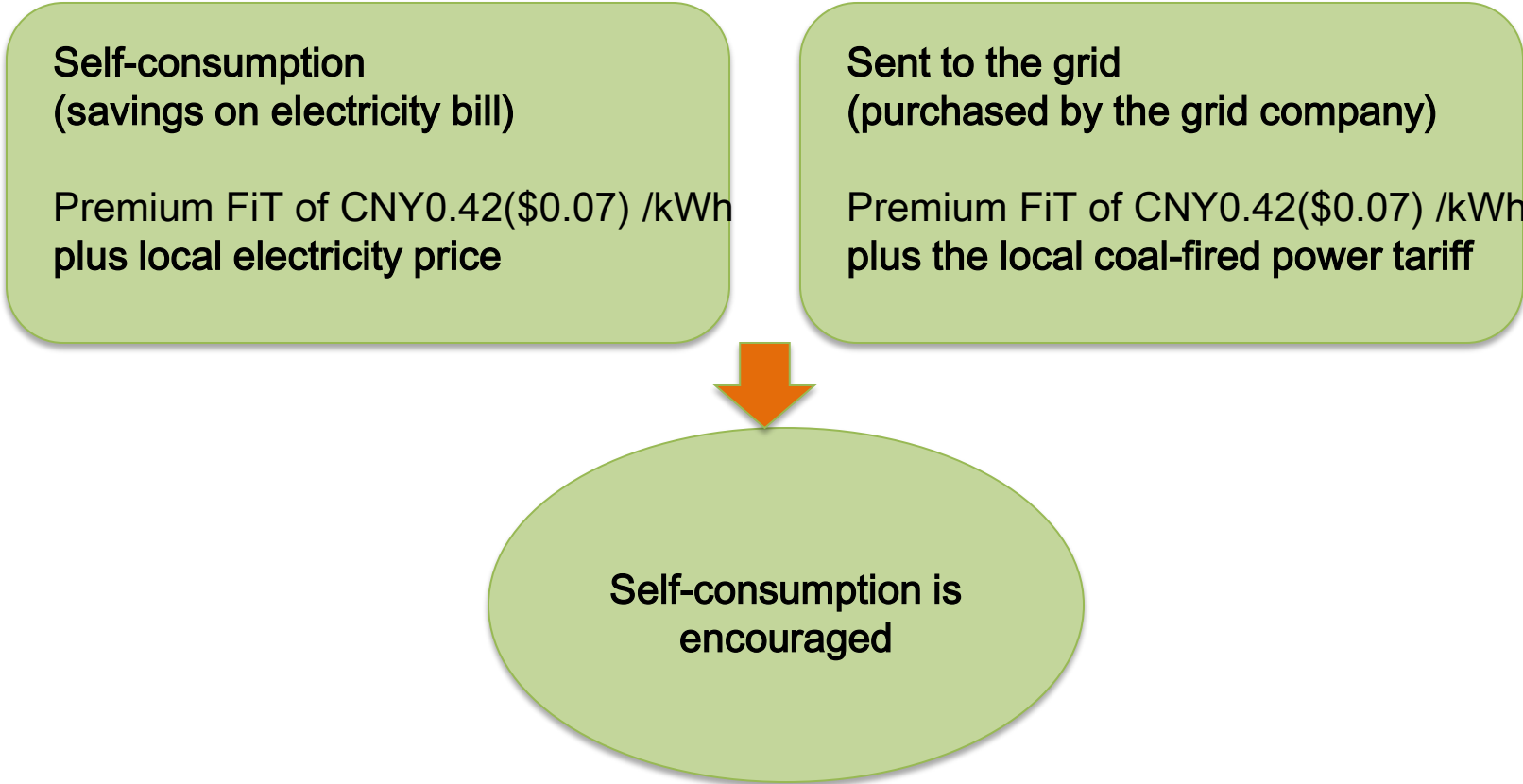
Distribution grid connected PV project

Self-consumption
(savings on electricity bill)

Premium FiT of CNY0.42(\$0.07) /kWh
plus local electricity price

Sent to the grid
(purchased by the grid company)

Premium FiT of CNY0.42(\$0.07) /kWh
plus the local coal-fired power tariff



**Self-consumption is
encouraged**

China's 12th Five-Year Plan (2011-2015): Renewable Energy is targeted to reach 33% of total electric power capacity by 2015, hydro and wind still dominating

Hydro

- Installed capacity of **420GW**, up from 211GW in 2010.

Wind

- Installed capacity of **100GW**, with annual electricity generation over 190 billion kwh.
- **5GW** off-shore

Solar

- PV Power: Installed capacity of **35GW**, including both large-scale and distributed power plants.
- CSP: Installed capacity of **1GW** by 2015, **3 GW** by 2020

Biomass

- **13GW** installed capacity by 2015, with annual electricity generation over **7.8 billion kwh**.

Integrated Demonstration Project

New energy cities (100)

- New energy makes over **3%** of primary energy consumption, no less than **6% by 2015**.
- At least **2 kinds of new energy** have to be deployed

Green energy counties (200)

- **Over 100** green counties have been granted
- A subsidy of **CNY 25 million** per county

New energy micro-grid projects (30)

- An integration of rooftop PV power station, energy storage system, electric car charging station and distribution network

Distributed PV power generation demonstration area (18)

- **18** projects with the total capacity of **1.8GW**
- Scheduled to complete in **2015**

China's 12th Five-Year Plan (2011-2015): New Energy Demonstration Cities

- According to the 12th FYP, China set the goal of establishing **100 new energy demo cities** to promote renewable energy deployment. The 100 cities accounts for **1/6** of the total number of Chinese cities.
- An NEDC is defined as a city making full use of local renewable energy sources like **solar, wind, geothermal and biomass**, with a high proportion of the primary energy consumption coming from renewables.
- With the NEDC plan, China shows strong will to kick out domestic market by encouraging local usage of renewables. **A focus transition** from manufacturing to end use is taking place, according to which energy consumption structure would be dramatically changed.

China's 12th Five-Year Plan (2011-2015): New Energy Demonstration Cities

- The key performance indicator of the demonstration cities is **the proportion of renewable energy sources** in the total energy consumption.
- Cities intending to apply need to have renewables accounting for **at least 3%** of its primary energy consumption by 2010, with a commitment of **no less than 6% by the end of 2015**. At least **2 kinds of new energy** have to be deployed, choosing from **solar, wind, biomass and geothermal**, with certain criteria for each selected.
- The initiative call was launched by National Energy Administration in **May 2012**, and the application and assessment of NEDC have been under progress.
- NEA is in consultation with the Ministry of Finance concerning **substantive financial support** for the NEDCs.

China's 12th Five-Year Plan (2011-2015): Green Energy Demonstration Counties

- According to the 12th FYP, China will establish **200 green energy demonstration counties by 2015**.
- Green counties are expected to **increase energy access** as well as **reduce carbon emissions** with a high share of renewable energy .
- County candidates are expected to meet 2 key criteria.
 - Annual use of new energy should be no less than **150,000 tonnes of coal equivalent**, or **1 ton of coal equivalent per household**.
 - Renewables account for **more than 50%** of rural life energy consumption, **80% households'** life energy use comes from clean energy, and the share of conventional biomass use is reduced **under 20%**.
- Green counties are supported by government fund in terms of project-based grants.
- So far, **more than 100 green counties** have been granted.

THANK YOU

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