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Incentives, Falling Cost and Rising Demand in China's PV Market

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Although China produces over 30% of the world's solar photovoltaics (PV), installed PV in China only reached a total of 140MW in 2008, according to the state-owned newspaper, China Daily, accounting for less than 1% of the global market share.

Today, however, solar PV is starting to increase its share in China's energy portfolio, with government support, falling solar power generation cost and rising demand as the main drivers for the uptake. In fact, China revised its 2020 target for solar power capacity from 1.8 GW to 20 GW, according to a recent report by Beijing's state-own *China Daily*.

Government Support

In order to promote the Chinese solar market, the Government has enacted several policies to support the burgeoning industry, including a regional feed-in tariff and national subsidies for solar PV installations.

A good example is East China's Jiangsu province, which is home to more than 160 Chinese PV manufacturers, including Suntech and Trina Solar. In June, the Jiangsu government put in place an attractive feed-in tariff (FIT). The price offered for each kWh of electricity from PV solar farms, rooftop projects and BIPV projects built this year is 2.15 yuan, 3.7 yuan and 4.3 yuan respectively [US $0.31, $0.54 and $0.63], which nearly covers project costs.

The FIT has spurred several leading PV manufacturers — including Suntech and Trina Solar — to oversee the development of 80-MW and 30-MW rooftop PV projects respectively.

By 2011, a total of 400 MW of PV — including 260 MW rooftop projects, 10 MW of BIPV projects and 130 MW solar PV farms — are scheduled to be completed in Jiangsu. While, prior to the plan, installed PV in Jiangsu was less than 3-MW.

In addition to Jiangsu, solar projects are also being developed in other parts of China, as solar companies are eager to take advantage of government subsidies and grab a larger market share. For example, with the help of 47.45 million yuan [US $6.95 million] from the nation's solar energy plan issued in March, a 3.65-MW PV project — a mix of rooftop mounted PV and BIPV — broke ground in Northwestern China's Ningxia region.

Falling Cost

Thanks to cheaper raw materials and PV technology innovation, solar electricity cost in China is estimated to have declined by 50% from 2006 to 2008, making solar power a strong candidate to become a major energy resource.

The latest data from Guangdong-based China Merchants Securities Co., Ltd. shows that the cost of polycrystalline silicon PV system in China decreased to 31 yuan per Wp in December 2008, 50% down from October 2006, due to cheaper polycrystalline silicon, better processing and higher cell efficiency.

Partly because of cheaper PV systems, estimated power generation cost of domestic PV solar farms declined by 43%, from about 4 yuan [US $0.59] per kWh in 2006 to 2.28 [US $0.33] yuan per kWh in 2008, according to a report from China Merchants Securities. While, the cost in China's sun-rich northwestern areas with 1,560 sun hours annually, even reached 1.93 yuan per kWh, exceeding the government's goal of decreasing the cost of solar electricity cost in China to 3 yuan per kWh in 2010. This trend is expected to continue due to greater production scale and better infrastructure.

According to the *China Solar Development Report* (2007) published by the nation's Energy Department, by 2030, China's solar electricity cost will still be high in proportion to that of major energy resources such as fossil fuel, nuclear power and hydropower, but declining solar electricity cost is making it more affordable in the Chinese market.

Rising Demand

Beijing-based China Electricity Power Research Institution predicts that China would fail to meet 6.4% of the country's electricity demand in 2010 and 10.7% in 2020. Due to its huge potential and proved achievements, solar PV is considered an important source to offset the gap.

Because the country has outstanding solar resources, the Chinese government has put solar power development at the top of its priority list. The official data shows that average yearly solar insolation in China ranged from 1,050 to 2,450 kWh/m² between 1971 and 2000, with 60% of land enjoying above 1,400 kWh/m².

At the same time, the government has seen successful PV development, which makes it more confident that solar PV is a viable electricity source. In 2002, 721 hybrid power stations — solar and wind — and 208 hydro power stations were built in seven regions of West China, providing electricity to 1.3 million people who suffered from energy shortages.

Similar cases of solar PV also contributed to developed economic regions of China. For example, in 2004, China built its first large-scale PV project in Shenzhen, 1 MW of PV that is supporting its International Garden and Flower Expo Park with about 1 million kWh per year.

Currently increasing PV installations are under construction in major cities such as Beijing, Shanghai and Hangzhou, heating up the Chinese solar PV market.

Yotam Ariel is an independent business consultant solely focused on solar PV. Based in Shanghai and fluent in Chinese, he has been conducting business in China for more than 4 years, assisting his international clients with market intelligence and government issues such as regulations and incentives. He is highly active in the renewable energy and greentech circle, keeping a close eye on this highly dynamic industry. You can contact him through yotam.data@gmail.com.