

## **RENEWABLE ENERGY: Smog and the lack of a business model make China's urban solar energy outlook murky**

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With a goal to demonstrate the use of renewable energy, Greenpeace was giving some serious thought to installing solar panels on their building's rooftop when the environmental group rented a training center two years ago in Beijing.

A Chinese solar panel producer was eager to help with the system installation. Government officials and utility executives also tried their best to smooth the grid connection. But when the rooftop solar system went online in 2013, problems quickly emerged.



Greenpeace staffers at one of the earliest rooftop solar projects in Beijing. Payment delays and smog are hampering industry growth.

Since Chinese energy consumers usually buy electricity from utilities, rather than selling it back, there are no regulations in place to guide the payment process. Besides that, Beijing's serious air pollution has diminished the amount of electricity the rooftop solar system can produce. According to a Greenpeace analysis, the rooftop solar system produced 50 percent less electricity on average in a normal day at smog-choked Beijing last winter. And when the city's air pollution hit a record on Feb. 27, the system failed to generate any electricity at all.

"We still need to take clouds, air humidity and other factors into account when considering the cause of the power losses; but regardless what the reason is, it is clear that rooftop solar panels may not always produce as much electricity as planned," said Cai Yuanqing, a climate and energy campaigner at Greenpeace in Beijing.

Such uncertainty has prevented many Chinese from installing solar panels on their rooftops, Cai said, adding that "people are hesitant, wondering how many blue-sky days Beijing will have and how much solar power they can actually get."

Lower power outputs caused by smog are just one of many problems which have kept Chinese energy consumers away from using rooftop solar energy. Statistics from the China National Renewable Energy Centre show that only 189 megawatts of distributed solar projects were added in 13 Chinese cities and provinces during the first quarter of 2014, making up less than 5 percent of the total installation target those regions are supposed to meet this year.

**Many policies, few projects**

This is despite a series of measures announced recently by Chinese policymakers aiming to promote small-scale solar projects in areas where the power is needed.

In February, the Chinese government unveiled a plan of installing 8 gigawatts of distributed solar projects in 2014. By contrast, its installation target for large-scale ground-mounted solar farms was only 6 GW.

China's distributed solar market barely existed until 2012, when the government decided to redress an imbalance caused by a glut of large solar farms located in the country's vast western region, where there is plenty of sunshine but not enough infrastructure to consume the generated electricity or transmit it thousands of miles away to populous eastern Chinese cities.

With that in mind, the central government and local authorities in recent years have created fiscal incentives for developers to install rooftop solar panels near locations of high energy demand. The government has simplified the process of hooking up installed panels with power grids and also ordered Chinese banks to help with project finance.

Yet still, few developers are interested.

Analysts attributed the lack of interest to lack of economic attractiveness. According to the industry's estimation, China's distributed solar yields annual returns of less than 10 percent, while that figure for large-scale solar farms is around 12 percent.

There is also an issue of work hassles associated with distributed solar installation. Since the majority of industrial parks in China are already equipped with rooftop solar panels, project developers now have to negotiate with many small property owners scattered in a large area for gaining new rooftop resources. That, in turns, complicates the negotiation process and increases operation costs.

### **Missing business models**

Some Chinese solar developers are willing to go through that trouble, but they have run into other barriers.

"Although the Chinese government has issued many supportive policies, there is still no business model available to support the boom of distributed solar," said Jiang Zhe, chief executive of Shanghai-based Upsolar, which specializes in rooftop solar installation in China.

One challenge that his company and other Chinese distributed solar developers face, according to Jiang, is how to protect their rights when one client moves out and the new property owner refuses to continue purchasing rooftop solar energy. Moreover, Jiang said that the obstacle of getting upfront investment for distributed solar projects remains unsolved.

At a solar energy investment summit hosted earlier this year in Beijing, National Energy Administration official Liang Zhipeng reportedly said that many banks in China have restricted -- and even banned -- loans to distributed solar projects. At another conference, when Chinese officials tried to do matchmaking between distributed solar developers and domestic banks, some bankers demanded the government first set up a safety net in case such investments turn into bad debts.

Chinese policymakers and industry players have been searching for financial resources other than bank loans. Already, a government-backed investment fund was established in April to help finance distributed solar installation. Meanwhile, Chinese insurers also came to help, with new insurance products being introduced to guarantee the sales of distributed solar generating electricity.

Jiang of Upsolar said that those measures have a potential to boost distributed solar in China, but he has yet to see any actual implementation. And since some measures are only adopted region wide, when or whether the efforts will be scaled on the national level is an unclear question.

"It is still extremely challenging for China to achieve its 2014 distributed solar installation target," Jiang concluded.

### **Solar farms versus rooftop solar?**

Anders Hove of Beijing-based consultancy Azure International agreed. Hove said it is possible that China's distributed solar development will speed up later this year once developers begin to approach 6 GW in solar farm constructions, which in theory will be the limit on subsidizing such installations. However, he added, another more troubling possibility is that Chinese policymakers will raise their planned installation target for solar farms, instead of making distributed solar more attractive.

"Solar developers flock to where the money is," said Sun Qingwei, an energy specialist at a nongovernmental organization Pacific Environment in Beijing.

"The Chinese government has already approved ultra-high-voltage power lines construction. Once the transmission network is in place, more solar farms will follow. I don't see how a fast expansion of distributed solar will happen in China now and for the next five years," Sun said.

Cai of Greenpeace, however, holds a more optimistic view. "China's distributed solar is likely to grow side by side with large solar farms," Cai said. "Rooftop solar energy is an attractive option for commercial energy users if China can solve existing problems such as project financing and ensure the sales of generated electricity."

And for his organization, which has yet to receive payment after selling solar energy to utilities for more than a year, Cai said there is still a plan to install more rooftop solar panels, because of concern about the environment. "When we choose a new office next time, whether or not that place can install solar panels will greatly weigh on our decision of where to go," Cai said.

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