



Photo: AP Photo/Xinhua

Electricity at last!
Hao Rilao and his wife are happy about the first photovoltaic installation in their village in China's Inner Mongolia.

The dragon discovers the sun

Millions of people in China live without electricity, but solar energy could change that.

First the good news: 98% of Chinese households are connected to the power grid, a figure sure to please the government in Beijing. It proves, after all, that China's well ahead with electrification compared to other agriculturally dominated emerging economies such as India's or Indonesia's. The flip side of the coin is that at least 30 million people in 29,000 villages are still waiting for electricity.

In Tibet alone, nearly 80% of rural homes are without it. In other regions, too, such as the two southwestern provinces Guizhou and Yunnan and Inner Mongolia in the central north, millions of Chinese must do without light bulbs, refrigerators and television. With the power supply inaccessible, economic development in these areas is for all intents and purposes stalled.

Cost is the main brake. In the remote regions of the vast country a connection to one of the 12 regional grids costs too much. The time has come for renewables. Stand-alone grids with photovoltaic (PV) cells, wind turbines and small hydropower stations are already cost-effective solutions for such villages.

by 2010. Last year Beijing put its money where its mouth was, launching "Song Dian Dao Yjang", a \$240 million programme to electrify remote communities with renewable energy sources.

"By the end of this year 1,000 villages in the western provinces with a total population of one million people are to be tapping elec-

Will grid-connected consumers help pay for remote stand-alone solar systems?

The almighty State Development Planning Commission (SDPC) has woken up to this and initiated the "Brightness Programme" in 1996. The Communist leadership's declared goal is to supply decentralised energy to some 23 million people

tricity from regenerative sources," says Shi Lishan, director of SDPC's renewable energy division. Two-thirds of the project are stand-alone solar electricity systems. That's no surprise given the fact that the sun shines in those regions for more

than 3,000 hours annually. "In 2002 we installed 700 PV systems with a total output of 20 megawatts," says Shi Lishan happily about the programme's start.

But it'll be a while before all of China's 1.3 billion inhabitants can enjoy a secure electricity supply. "We have a huge challenge ahead of us," says professor Ma Shenghong of the Beijing Jijedian Renewable Energy Development Center. He foresees problems with the cost. "Solar electricity is four times as expensive as regular power. For the rural population that's clearly too high." To make decentralised solar energy affordable, Ma Shenghong endorses a cost allocation system, in which power customers in grid-connected areas help pay for the extra costs of the stand-alone solar systems. Not a bad idea, but that's not about to happen any time soon.

The Chinese expert is concerned about the remote regions' lack of maintenance expertise required for PV systems. Germany's government-owned agency for international cooperation, GTZ, is also aware of this and is using two newly launched project offices in Qinghai and Yunnan to train specialists. They're to ensure that the solar systems remain fully functional for the next 20 years.

Positive signs are also coming from the official side. The Chinese initiated 13 service companies in seven provinces, which are to mind the operation and repairs of the

Photo: GTZ



The new China: Renewable energy generators changing rural images.

solar modules. "Now the main thing is that these companies generate enough capital in the initial years," says Frank Haugwitz, a development expert at GTZ's Beijing office. "Investment for replacements, such as batteries, is only possible if you have

Besides the GTZ, Germany's Kreditanstalt für Wiederaufbau (KfW) bank is also supporting the electrification of Chinese villages, financing the construction of some 300 solar systems and a mini power grid in four western provinces. An-

Sources: Nearly 80% coal, 16% large hydro, 1% sun, wind, biomass, small hydro

sufficient reserves." He also says that the users must be able to identify with the systems. "The only way to do that is with money," says Haugwitz. "If the people pay an adequate price for solar electricity, then their perception of the value of the PV systems rises."

other essential backer of PV projects is the World Bank. Its Asia Alternative Energy Programme is supporting 16 Chinese companies that are developing production lines for stand-alone solar systems. For every Watt of installed capacity, the World Bank guarantees a credit line of \$1.50. Ten megawatts of production capacity for grid-independent solar systems is to be created in this way.

As important as photovoltaics may be for remote regions, overall it plays only a very tiny role in the nationwide power supply. As the world's second biggest power producer, China, with a total output of 353,000 MW, generates nearly 80% of its electricity from coal. Sixteen per cent comes from large-scale hydropower, which Beijing is pushing now to expand further. The Three Gorges Dam on the Yangtse River, which will be the largest dam in the world, is supposed to produce electricity with a power capacity of 18,200 MW alone. Renewables – the sun, wind, biomass and small hydro – account for less than 1% of national electricity production.

Photos (2): Länker



Shi Lishan, Director of the renewable energy division of the all-powerful State Development Planning Commission.



"We're still far way off sustainable development," says Shi Lishan of SDPC openly. China's current Five-Year Plan foresees increasing PV capacity to 80 MW and wind power capacity to 1,500 MW by 2005, but given increasing demand,

al output of 5 MW to Huangshan in eastern Anhui province in April. Ho Tin Solar's strategy is evident: the new factory will produce exclusively stand-alone solar power systems.

But the global solar sector isn't sleeping. Companies such as Shell

line wafers in Baoding, 150 kilometres south of Beijing, by the end of the year. Solar module finishing is to reach 50 MW there by the end of 2006.

The growing solar industry is giving hope to the people in Tibet and in other remote provinces that they will soon have access to a power supply from the sun and other renewable sources. The rural population can look forward to a little luxury, as professor Ma Sheng-hong likes to demonstrate by telling a little anecdote from Inner Mongolia. Baiyiaobao is one of the first villages to have gotten a solar power plant as part of the rural electrification programme. "As soon as the stand-alone system was installed," he says, "the locals gathered in a small school building, decorated the classroom with lights, whipped up a stereo and spent the night celebrating in the first disco in the history of the village." ■

By Oliver Lönker



Ma Shenghong,
Deputy-Director of
the Beijing Jikedian
Renewable Energy
Development Center.

that's only a drop in the ocean. For the time being the Communist Party leadership is trying to build up a positive image with a handful of prestige projects to attract foreign investors.

For example, Beijing recently dubbed the summer games taking place in 2008 the "Green Olympics". The organisers hope primarily to put an end to the dramatic air pollution caused by inefficient coal-fired power plants located in the city centre. In future, energy is to come from natural gas and electricity from plants outside the city. Renewables are little more than icing on the cake. PV modules with a capacity of three megawatts will supply the Olympic village with energy for street lanterns.

So it's no wonder that the solar industry sees its biggest growth prospects in rural electrification. The most recent confirmation of this came with a deal worth millions between Chinese joint venture company Ho Tin Solar Technology Development and US company Spire Solar. The Bedford, Massachusetts based company delivered a PV module production plant with annu-

and BP have long had solar module production facilities in China. The biggest solar cell producer, however, is Chinese. The Yingli Energy Corporation intends to build 10 MW of production capacity for polycrystal-

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