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Green Power Takes Root in the Chinese Desert

By [KEITH BRADSHER](#)

DUNHUANG, [China](#) — As the United States takes its first steps toward mandating that power companies generate more electricity from renewable sources, China already has a similar requirement and is investing billions to remake itself into a green energy superpower.

Through a combination of carrots and sticks, Beijing is starting to change how this country generates energy. Although [coal](#) remains the biggest energy source and is almost certain to stay that way, the rise of renewable energy, especially wind power, is helping to slow China's steep growth in emissions of [global warming](#) gases.

While the House of Representatives approved a requirement last week that American utilities generate more of their power from renewable sources of energy, and the Senate will consider similar proposals over the summer, China imposed such a requirement almost two years ago.

This year China is on track to pass the United States as the world's largest market for [wind turbines](#) — after doubling wind power capacity in each of the last four years. State-owned power companies are competing to see which can build solar plants fastest, though these projects are much smaller than the wind projects. And other green energy projects, like burning farm waste to generate electricity, are sprouting up.

This oasis town deep in the Gobi Desert along the famed Silk Road and the surrounding wilderness of beige sand dunes and vast gravel wastelands has become a center of China's drive to lead the world in wind and [solar energy](#).

A series of projects is under construction on the nearly lifeless plateau to the southeast of Dunhuang, including one of six immense wind power projects now being built around China, each with the capacity of more than 16 large coal-fired power plants.

Each of the six projects “totally dwarfs anything else, anywhere else in the world,” said Steve Sawyer, the secretary general of the Global Wind Energy Council, an industry group in Brussels.

Some top Chinese regulators even worry that Beijing’s mandates are pushing companies too far too fast. The companies may be deliberately underbidding for the right to build new projects and then planning to go back to the government later and demand compensation once the projects lose money.

“The problem is we have so many stupid enterprises,” said Li Junfeng, who is the deputy director general for energy research at China’s top economic planning agency and the secretary general of the government-run Renewable Energy Industries Association.

[HSBC](#) predicts that China will invest more money in renewable energy and nuclear power between now and 2020 than in coal-fired and oil-fired electricity.

That does not mean that China will become a green giant overnight. For one thing, Chinese power consumption is expected to rise steadily over the next decade as 720 million rural Chinese begin acquiring the air-conditioners and other power-hungry amenities already common among China’s 606 million city dwellers.

As recently as the start of last year, the Chinese government’s target was to have 5,000 megawatts of wind power installed by the end of next year, or the equivalent of eight big coal-fired power plants, a tiny proportion of China’s energy usage and a pittance at a time when China was building close to two coal-fired plants a week.

But in March of last year, as power companies began accelerating construction of wind turbines, the government issued a forecast that 10,000 megawatts would actually be installed by the end of next year. And now, just 15 months later, with construction of coal-fired plants having slowed to one a week and still falling, it appears that China will have 30,000 megawatts of wind energy by the end of next year — which was previously the target for 2020, Mr. Li said.

A big impetus was the government’s requirement, issued in September 2007, that large power companies generate at least 3 percent of their electricity by the end of 2010 from renewable sources. The calculation excludes [hydroelectric](#) power, which already accounts for 21 percent of Chinese power, and nuclear power, which accounts for 1.1 percent.

Chinese companies must generate 8 percent of their power from renewable sources other than hydroelectric by the end of 2020.

The House bill in the United States resembles China's approach in imposing a renewable energy standard on large electricity providers. But the details make it hard to compare standards. The House bill requires large electricity providers in the United States to derive at least 15 percent of their energy by 2020 from a combination of energy savings and renewable energy — including hydroelectric dams built since 1992.

Chinese power companies are eager to invest in renewable energy not just because of the government's mandates, but because they are flush with cash and state-owned banks are eager to lend them more money. And there are few regulatory hurdles.

At the same time, the Ministry of Environmental Protection has temporarily banned three of the country's five main power companies from building more coal-fired power plants, punishment for their failure to comply with environmental regulations at existing coal-fired plants. China's renewable energy frenzy has been accelerating recently, especially in solar energy.

Last winter, winning bidders for three projects agreed to sell power to the national power grid for about 59 cents a kilowatt hour.

But this spring, when the government solicited offers to build and operate the 10-megawatt photovoltaic solar power plant here in Dunhuang, the lowest bid was just 10 cents a kilowatt hour — so low the government rejected it as likely to result in losses for whatever state-owned bank lent money to build it.

The winning bidder was China Guangdong Nuclear Power Company, an entirely state-owned business that bid 16 cents a kilowatt hour. (That was still far below last winter's price, but a two-thirds drop in raw material costs because of the global financial crisis has started to drive down the cost of solar panels, the chief expense for the winning bidder.)

Zheng Shuangwei, the company's general manager for northwest China, said that 22 or 23 cents would be more fair. The bid of 16 cents "is not a proper price," he acknowledged. "It's a bidding rate that is the result of competition."

By comparison, the grid buys electricity from coal-fired power plants for 4 to 5 cents a kilowatt hour. Wind turbine rates have dropped to 7 cents from 10 cents over the last couple of years because of fierce competition and declining turbine costs.

The solar project still must go ahead, Mr. Zheng said, because China has limited coal reserves — 41 years at current rates of production — and the potential for hydroelectric power is leveling off as most eligible rivers have already been dammed.

But technical obstacles to renewable energy are popping up. Sandstorms in Dunhuang in the spring, for instance, will cover solar panels and render them useless until they are cleaned after each storm by squads of workers using feather brushes to avoid scratching the panels, a process expected to take two

days.

And wind turbines are being built faster here than the national grid can erect high-voltage power lines to carry the electricity to cities elsewhere. On the windiest days, only half the power generated can be transmitted, said Min Deqing, a local renewable energy consultant.

Nonetheless, city officials are pushing for more projects.

“It’s the Gobi Desert,” said Wang Yu, the vice director of economic planning. “There’s not much other use for it.”

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