

Green days

By James Roy

Transforming into a global economic powerhouse can be a messy business. A powerhouse needs plenty of juice, and China's use of its primary energy resource, coal, contributes to the unenviable fact that China is the world's second-largest emitter of greenhouse gases, and stands to overtake the United States in the top spot within the next few years. China's development is far from complete, which means that its already voracious demands for energy are, if anything, going to go up. A key problem facing China is how to fuel its future progress without clogging up the skies with yet more smoke, and the powers that be have decided that renewable energy is going form a big part of the solution. Renewable energy is high on the agenda indeed. Beijing's plan, first articulated in 2005, is for 16 percent of China's energy to come from renewable sources by 2020, which would make it the world leader in terms of energy produced.

Leaders in the capital, whose public pronouncements so often include the words "sustainable development", are certainly aware of the effects of a coal-heavy energy base. The World Bank estimates that pollution could be costing China over US\$50 billion (?37 billion) a year. Energy security is also a concern - renewables fit squarely into the country's overall energy-diversification push, which has seen it secure oil and liquid natural gas deals all over Asia and Africa, to reduce its domestic reliance on coal. China's supply of thermal coal, while abundant, has been prone to disruptions in the past, according to Joseph Jacobelli, head of Asia Pacific Utilities Equity Research at Merrill Lynch. "China, in my view, is conscious that this may occur again. As such, the economic authorities fully realise it is imperative to gradually diversify the energy consumption fuel mix away from thermal coal."

Using renewable energy is also a way for China to fulfil social obligations to some of its poorest citizens, a point of emphasis for the government since the release of its 11th five-year plan last year. As many as 30 million people in poor and isolated stretches of the country have no electricity. Installing renewable energy projects like wind farms and biomass plants are an efficient and cost-effective way of bringing electricity to the rural poor, Beijing reasons (it has earmarked US\$5 billion to this end).

Force of law In the beginning of 2006 China introduced the Renewable Energy Law, legally cementing the importance of renewable energy, and making it subject to national level planning. The National Development and Reform Council gave targets to China's big power generators - those controlling an installed capacity of over 5 gigawatts (GW) - to produce 5 percent of their power through renewable means by 2010, and 10 percent by 2020.

The response has been generally positive. The law "provides a very good legal framework for the industry," says Yang Ailun of Greenpeace China. "I think that this law came out at a time when there was already a lot of enthusiasm for renewable energy. It was not like this law started the whole thing, considering China's high demand for energy. [It] gave the industry a lot of confidence and it shows that they are serious about their commitment to renewable energy." Even with strong government backing, there is the issue of how to make renewable sources competitive with its polluting competitor, coal . On average, China's electric power "is one of the cheapest amongst the world's major electric-power-producers - including the US, Japan, Europe and the like," says Jacobelli. This, he says, is surely because few other countries rely so heavily on coal, which costs "on average RMB300-400 (?29-38) per megawatt-hour (MWh) ... compared with well over RMB500/MWh for wind and biomass projects." The success of renewable energy will depend on employing the best technologies in the most efficient manner.

Therefore plenty of hope is being attached to wind power, whose advocates laud as the technology with the greatest potential. Not only is the technology advanced and inexpensive, they argue, it can be employed on a much larger scale than either hydro or solar power. Wind farms usually produce electricity in the tens of megawatts, while solar plants are measured in the hundreds of kilowatts. This is attractive to large power producers who benefit logistically by only having to manage a handful of wind farms instead of dozens of smaller solar plants.

And compared to biomass, China's other renewable hopeful, wind power is soaring ahead. By the end of 2005, China had 1,260MW of installed wind-power capacity; and although the figures for 2006 have not yet been released, it is expected that capacity increased by 1GW, an increase that is expected to be repeated in 2007. While wind power was doubling its capacity between 2005 and 2006, biomass only saw an increase of 10 percent.

Given China's massive rural population and its considerable agricultural output, it might be thought that biomass would be a perfectly suited technology to the country, but in fact it could prove harmful for the poorest Chinese. Growing too many "energy crops" in place of crops to be used for food, China's leaders fear, would cut into the food supply and drive basic food prices perilously upward. "In a country with this big a population, the government wants to guarantee that the price of food is stable before they approve biomass projects," says Yang.

Pricing problems If wind power really is the most promising renewable technology, it would pay for China to nurture it. But a recent report produced by Greenpeace, the China Renewable Energies Industries Association, and the Global Wind Energy Council expresses concern that wind-power is not being priced in the best way to nurture the industry.

Under special scrutiny are concession projects, a special scheme designed by the government to encourage growth in the wind-power industry. Under these projects, the government picks an area where it wants a wind farm and then invites developers to bid for the project, who are expected to propose large wind farms at a minimum of 100MW. The benefit for the developer is that the power generated is sold to the grid at a constant price for the first 30,000 hours of operations, thereby protecting the developer from potential fluctuations in the market.

The problem is that the initial price is proposed by the developer in the bidding documents, and cost is a key factor when the government decides who is awarded a project. Big developers, keen to acquire the projects so that they can meet their government-mandated renewable-energy quota, have made applications that were unsustainably low, says Mark Kelleher of Roaring 40s, an Australian company that has six wind-power projects in China. He claims that the bidding process did not always bring about the best outcomes: some of the projects did not go ahead, and some developers tried to have the conditions changed after the auction.

Beijing's enthusiasm for concession projects is not the best way to promote wind-power in China, according to Greenpeace's Yang. Not only are the big providers proposing infeasible projects, she says, the low prices are undercutting small and foreign investors. The environmental group's report recommends that the bidding system be replaced by a feed-in tariff system, in which developers are paid a benchmark price plus a wind-power premium, until wind power in China grows to a scale that it can compete with coal. It is unlikely that there will be a change in the law, but a system of tariffs is expected to be brought in over the next couple of years.

That wind power is going to be a major source of renewable energy is a given, but the concession projects are limiting its full potential. The current target for wind power by 2020 is 30GW. Yang predicts that even if the current policy remains the same, China will reach 50GW; but she estimates that if China puts in place more supportive policies, the figure could be double that.

Green investments Future growth in renewables means, naturally, there will be plenty of attractive investment opportunities. "I believe that China is one of, if not the, most attractive renewable energy sources market in the world in terms of growth potential," says Jacobelli. At present, the vast majority of investment is coming from state-owned, nationwide power groups like China Huaneng, China Guodian and Shenhua. Jacobelli estimates that domestic investment accounts for around 90 percent of the current total.

The large producers have to invest heavily in equipment, making manufacturing a likely area for investment for foreign companies. Many of the world's largest wind-power equipment manufacturers are either selling to or manufacturing in China. Wind-power concession projects offer an incentive for foreign turbine manufacturers to set up factories in China, since they require a certain proportion of equipment to be produced domestically.

The world's two largest wind-power technology companies, Denmark's Vestas and Spain's Gamesa, have invested in their own manufacturing plants in Tianjin. "We're here to be the market leader by producing in China for China, as well as for our customers across the world," says Lars Andersen, Vestas China's managing director. It makes sense for foreign wind power companies to manufacture here since the vast majority of wind power equipment used here comes from overseas. But domestic competition is heating up. "There's no question that there is a strong will in China to gain momentum in the manufacturing market. There are some very capable local manufacturers who will become competition in the future." The area of manufacturing that Chinese firms have already managed to excel in is the production of solar power equipment, with companies ranging from small start-ups to major international operations making solar panels for mainly an export market. Most notable is Suntech Power, which has managed to become one of the world's top 10 solar-panel manufacturers in terms of production output since its inception in 2001.

Nothing will promote the growth of the renewable energy market like the substantial investment from the private sector that can already be seen. Combined with the government's grand targets, it creates a firm foundation for a healthy renewable energy industry. China has become famous as one of the world's biggest polluters, but its drive for clean power is at least boosting incentives for a greener future.

Carbon-trading magnet In February, China announced two major carbon-trading initiatives designed to reduce the country's carbon emissions and contribute to poverty reduction. One project is a proposed carbon exchange in Beijing, which would be the first outside Europe and the United States. The other, MDG Carbon, shall invest US\$1.7 million (?1.3 million) with the aim of helping both businesses and governmental bodies deal in carbon credits.

The Clean Development Mechanism (CDM) a section of the Kyoto Protocol that gives industrialised countries the option to invest in emission-reducing projects in developing countries in exchange for carbon credits, helps: The UN predicts that by 2012, China will account for 41 percent of all the carbon credits issued under the scheme.

Although the details of how the proposed exchange will work are not yet clear, companies involved in carbon trading welcome the idea. "A carbon-trading exchange in China will reduce our costs in doing business," says Wei He, CDM project technology manager at Azure International, a company that helps its clients sell their carbon credits. "If the exchange is here more and more, companies will become aware of CDM, making our business easier in the future." Beijing-based energy consultant Jim Brock believes the government is using CDM more as a means of supporting social projects in China. "They see it as a form of money, like a foreign grant, but with conditions attached to it," he says.

The projects supported tend to involve biomass and methane, with the government installing biomass equipment, ostensibly to reduce carbon emissions, but mainly for the benefits to the villagers receive, such as a means of providing heating.

If China decides to free up control of CDM, the challenge will be designing credits that promote social aims as well as reduce emissions. It will have to be quick; the Kyoto Protocol expires in 2012, and its sequel could bring in a whole new environment of obligations.

Renewed enthusiasm The renewable energy sector in China is very much a broad field for investors from abroad: the Chinese government labelled it as an encouraged sector for foreign investment, allowing foreign companies to come in with no restrictions on their capital structure.

The introduction of the Renewable Energy Law at the beginning of 2006 further strengthened confidence. "This has created a framework where European companies can play with certain security," says Alberto Méndez, vice-chair of the European Union Chamber of Commerce in China's Energy and Utility Policy Working Group. Nevertheless, there are still some issues that need ironing out. "We still find some gaps and uncertainties that are typical in such a young and constantly changing market," says Méndez.

Wind power came up as one of the key recommendations made by the Energy Working Group in the Chamber's 2006-2007 Position Paper. "This recommendation is mainly related to providing a sustainable framework for the development of the wind-power industry through a fixed electricity price

that will lead to profitable projects and therefore to the credibility of an industry and technology that is working with great success in other countries," says Méndez.

The other main issue relates to Clean Development Mechanisms (see Carbon-trading magnet, p42). While there is still great potential for development of China's CDM, foreign companies interested in CDM projects are restricted to a 51-49 joint venture structure. This has the effect of both limiting companies; ability to manage projects and reducing the returns on their investments. The approval process can also be quite lengthy.

Europe is a world leader in renewable energy development. Its renewable sector employs around quarter of a million people and which saw a turnover of ?15 billion in 2005. Méndez is confident that Europe can provide support China's renewable sector. "All this experience and expertise could be used in China to promote the growth and stability of the industry."

European Chamber of Commerce in China

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