China's new path

by Yingling Liu

China is at an energy crossroads. The dominance of coal in its energy structure — and the country's avid search for new energy sources around the globe — have heightened concerns over energy security and environmental and economic sustainability, not to speak of China's contribution to the global climate challenge. As its energy consumption rises, never has it been so urgent for China to find clean energy alternatives and expand their share in the total energy mix

Indeed, this is happening on the ground. A combination of government policies and the market has recently driven a renewable energy boom in China. It shows how state policies can encourage and sustain the development and expansion of industries for a new market niche, and how market forces can inject vitality into the private sector and thus greatly hasten the achievement of policy goals. This mutual reinforcement between policies and the market is likely to prove the most lasting and profound force in pushing China towards a new energy path.

China's landmark renewable energy law — passed in 2005 and coming into effect at the start of 2006 — has been the most decisive policy tool. It requires the government to formulate development targets, strategic plans, and financial guarantee measures for renewable energy, and provides preferential guidance on cost sharing frameworks, grid accessibility and pricing mechanisms. The law, together with a series of implementation regulations, has caused the immediate take-off of several renewable energy industries such as wind, solar photovoltaic (PV) and biomass, and reinforced the expansion of others, including hydropower and solar hot water.

Wind power has recently been the fastest growing renewable energy source. The law gave the long-dormant industry a jumpstart, and the unexpectedly enthusiastic response from the market caused policy makers to hasten to raise its short- and mid-term targets. Additional installed capacity grew by over 60 per cent in 2005, and more than doubled in both 2006 and 2007. By the end of 2007, cumulative capacity had reached roughly 6 GW — up from just 0.8 GW in 2004 — ranking China fifth among all the world's nations for wind installations. Cumulative installations in 2007 exceeded the target set for 2010 just one year ago, and the 2020 target of 30 GW is expected to be reached by 2012, eight years ahead of schedule.

China's solar PV industry has also seen phenomenal development. Surging worldwide demand — particularly from Europe and the U.S. — has encouraged the development of a world-class solar PV manufacture base in China, literally from scratch. The country's total solar cell production jumped from less than 100 MW in 2005 to 1,088 MW in 2007, making it the world's top producer. Chinese experts and business leaders believe that production will exceed 5 GW by 2010, accounting for a third of the world total, and reaching 10 GW by 2015. Though the lion's share of China's production is for overseas markets, the country is unquestionably turning into a major global solar PV base.

Biomass energy is starting to shift from traditional burning in rural homes to commercialized industrial-scale power generation. China has prioritized this since the energy law took effect. Mainly using waste from the agriculture and forestry sectors, installed capacity is projected to increase from 2 GW in 2005 to 30 GW by 2020, providing a growing share of the country's green electricity.

The recent policy tools have also consolidated and advanced traditional renewable energy industries, including hydropower and solar thermal panels, where China has already been a world leader. The technologies are comparatively simple and low-cost, and the country has developed fairly strong construction, manufacturing and installation industries for both sources. They are still dominant in China's renewable energy use, and are expected to see continuous strong growth.

Hydropower accounts for about two-thirds of China's current renewable energy use. It has grown by over 8 per cent annually from 2002 to 2006, and installed capacity will reach 190 GW by 2010 and 300 GW by 2020. China also has nearly two-thirds of the world's solar hot water capacity: more than one in every ten households bathe in water heated by the sun. Such solar thermal has witnessed 20-25 per cent annual growth in recent years, with installed capacity rising from 35 million square metres in 2000 to 100 million square metres by the end of 2006. The government aims for 150 million square metres by 2010 and double that figure by 2020. A more optimistic prediction envisages 800 million square metres installed capacity by 2030, which would mean that more than half of all Chinese households would be using solar energy for water heating.

Renewable energy has become a strategic industry in China. The country has more than 50 domestic wind turbine manufacturers, over 15 major solar cell manufacturers and roughly 50 companies constructing, expanding or planning for polysilicon production lines, the key components for solar PV systems. Those two industries together employ some 80,000 people. The country also has thousands of hydropower manufacturers and engineering and design firms. More than a thousand solar water heater manufacturers throughout the country — and associated design, installation and service providers — provide some 600,000 jobs. As renewable industries are scaled up, costs will come down, enabling faster and wider utilization, and private industry will have an increased stake in lobbying for a bigger share of the domestic market.

China currently gets 7.5 per cent of its primary energy from renewable energy sources. The government aims to expand that to 15 per cent by 2020. Yet development in the marketplace shows that this target could well be exceeded, and that its share will keep rising beyond 2020. The takeoff and strong advancement of renewable energy in China is significant not just in green powering of China's future economic growth, but in providing hope for environmental well-being worldwide. UNEP