



China

the rise of the green city

China's rapid urbanisation is cause for concern, but remarkable initiatives in cities such as Rizhao, Wuhan and Beijing are leading to a broader endorsement of sustainability principles, write **Matthew Levinson** and **Jing Chen**.

Look across the rooftops and walls of Rizhao, a coastal city of nearly three million on the Shandong Peninsula in China's north-east, and you will see rows of solar panels on nearly every building. The traffic signals and street and park lights downtown are powered by photovoltaic solar cells, and virtually all the city's residents use solar energy for their hot water.

Per capita incomes in this small Chinese city are even lower than most other cities in the region, but Rizhao's response to sustainability has been far from ordinary.

CSIRO's Xuemei Bai, who covered the initiative in 'State of the World 2007: Our Urban Future', an annual report published by the World Watch Institute, says the remarkable achievement resulted from a meeting of three factors: 'A government policy that encourages solar energy use and financially supports research and development, local solar panel industries that seized the opportunity and improved their products, and the strong political will of the city's leadership to adopt it.'

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The ensuing technological breakthroughs have reduced the cost of a solar hot water heater to around the same price as an electric one, and a mix of regulation and public education has ensured wide adoption of the heaters. The city now mandates the incorporation of solar panels in all new buildings, and oversees the construction process to ensure the panels are correctly installed.

According to Phil McKenna at *New Scientist* magazine, the Chinese

Government plans to extend the policy practice developed in Rizhao to all cities in China, and the mayor of Rizhao has been promoted to chair the city committee in the National People's Congress.

Rapid growth

China's cities are growing fast. How fast? China had 200 cities until just before 1980. This has more than tripled to 655 cities, according to Chinese National Bureau of Statistics data, and 177 of those have populations of more than a million people.

Government estimates put 44 per cent of China's population living in cities. However, Deng Wei, an urban economics researcher at Tsinghua University, reported in *Science* that the real figure is already 50 per cent, considering that migrant workers have registered their addresses as those of their rural homes.

Until the 1980s, China carried out nationwide recycling campaigns, with at least one recycling station in every urban district or small city. However, rising income levels and reduced government support have shrunk this to an informal process carried out by the urban poor.

Progress has, however, been made in

many areas – not just improvements to pollution control, ecological restoration and biodiversity conservation, but also improvements to environmental policy, law, funding mechanisms and implementing international treaties.

By the end of 2006, Chinese authorities had proposed more than 200 environmental policies and enacted at least 58 environmental laws and 17 regulations to control air and water pollution.

Though far from mature, environmental performance ratings and public disclosure have proven effective in getting Chinese firms to improve their environmental compliance. Green production processes are also helping to improve the efficiency of resource use, product quality and the environmental performance of Chinese factories.

Remarkable initiatives

Urbanisation is an inevitable fact in China. But it needs to be nudged to a more sustainable path, which is where sustainability initiatives such as Rizhao's are important. By showing the environmental, social and financial benefits of tackling sustainability, such projects can lead to a broader endorsement of sustainability principles.

For example, in Beijing, where private vehicle ownership is predicted to reach 3.8 million in 2010, the government has invested 1.3 billion yuan (more than AU\$196 million) to subsidise public

transport. That will reduce fares to less than one yuan (about 15 cents Australian), according to the Xinhua News Agency.

Community well-being is an important part of urban sustainability, especially in a country with China's huge population and long history.

The central government touts China's largest inland river port, Chongqing City, as a 'gateway to the West', which attracts an influx of workers to the heavily industrialised city. The city has responded to this influx with the innovative 'One Yuan Sunshine Apartment' program to provide cheap, quality housing for temporary workers.

On the third floor of one commercial apartment building in the city's Nan An District, 34 rooms house 150 workers. As



Solar water heaters populate the rooftops of most Rizhao buildings, thanks to local government subsidies for low-cost water heater manufacture. iStockphoto

well as beds, tables, chairs and cupboards, the workers have canteens, reading rooms, audio-visual rooms and public toilets. The upshot is that workers have a safe place to live and a fixed address, which also provides the government with a means of communicating with them.

Another low-cost housing project is centred on Wuhan, one of central China's major transport hubs. Old urban areas still make up a large part of Wuhan's central district, as is the case in most Chinese cities. Housing quality is low, the infrastructure worn and the population poor, but they do have a rich cultural heritage.

In the Jiang'an District of Wuhan's old area, development was encroaching on historic, traditional 'Lilong' houses. A project co-funded by the European Union brought together Chinese officials, experts from China and abroad, companies and local communities to look at ways of improving the physical environment, quality of life and social cohesion of local communities – especially for disadvantaged groups – and at the same time preserve the district's cultural and historical heritage.

The outcome is five demonstration redevelopments that are already generating social benefits and attracting tourists to the city. According to the project's chief manager, representatives from more than 40 cities have come to Wuhan to learn about the initiative.

Building new cities

The equivalent of Canberra's entire population migrates to Shanghai every year. These 325 000 people have to settle somewhere, and the pressure is stretching the city's boundaries.

This year, construction begins on Dongtan, an 86-square-kilometre eco-city located on Chongming Island, over the Yangtze River from Shanghai. Designed and master-planned by engineering firm Arup, it will be a city of three villages, with a 'demonstrator' phase for up to 10 000 people expected to be completed by 2010.

By building on sustainability projects and best-practice initiatives elsewhere, the city government hopes to create what it calls an 'eco-demonstrator' development which includes improved insulation, low-energy lighting and appliances, drastically reduced waste to landfill, zero tailpipe emission cars, and energy from renewable sources such as rice husks to fuel solar panels, wind turbines and biomass cogeneration plants.

Sceptics ask whether the technical and implementation challenges of such a project are even possible, but after successes such as the Rizhao solar project, city administrators across China are sitting up and taking notice.



Rizhao, a 'small' coastal city of nearly three million in north-eastern China, is a national leader in sustainable urban design. iStockphoto