Building ecologically in China

Researchers from TU Delft are trying to help with the construction of an ecocity in China, but cultural differences are turning the project into a hornets’ nest.

Tomas van Dijk

“The city consists of built-up bubbles, like concentric spheres, surrounded by lots of greenery. People move around by PRT [personal rapid transit: small automated electric vehicles, ed.]. There will also be an international campus that will form a living laboratory for research into intelligent networks.”

Using futuristic images, Professor Martin de Jong, of the Next Generation Infrastructures (NGInfra) research programme, describes to a select group of Chinese administrators the contours of the planned ecological city of Pingdi, on the edge of the metropolis of Shenzhen in southeast China.

Whereas urban development is primarily an academic exercise in The Netherlands, creating a city of millions of people in no time is nothing remarkable in China. Shenzhen, which is directly opposite Hong Kong, is a stunning example. Since the city was given Special Economic Zone status in 1979, it has grown from an insignificant fishing village to one of the world’s leading cities, and home to 14 million people.

At the request of Tang Jie, one of the deputy mayors of Shenzhen, researchers from TU Delft are helping to consider how the city can develop further in a sustainable manner. The city has grown thanks to a polluting and labour-intensive manufacturing industry, and suffers from traffic congestion and contaminated air, soil and water. Pingdi is intended to be a test case in how things can be done differently. The plan is for a densely populated, environmentally-friendly city to be created in this 50-square kilometre suburb, surrounded by nature and attractive to clean innovative companies and knowledge workers. The population of this future ‘ecocity’ – a buzzword in China, of which the country officially has many dozens – is set to grow from its current level of around 50,000 to 500,000 or even a million.

De Jong, who as well as being an assistant professor at the faculty of Technology, Policy and Management (TPM), is also a full professor at Harbin, located in northern China, and in charge of the Pingdi project. “It is fairly unusual for a large city like Shenzhen to approach foreign academics for such a prestigious project,” he says. “The city had already involved Chinese firms, but did not think their plans went far enough. They then clearly decided to give the commission to a group of mugs in the Netherlands,” he laughs.

For the academics in question, there could hardly be a better testing ground in which to research urban infrastructures of the future, the central theme of NGInfra. “Creating a city of millions of people in no time is nothing remarkable in China’

In November, academics from TU Delft presented their vision for Pingdi at the Next Generation Infrastructure Systems for Eco-cities Conference in Shenzhen. They appeared with their partners from the Harbin Institute of Technology, which has a branch in Shenzhen (the HIT Shenzhen Graduate School), and with architect and TU alumnus Neville Mars of the Dynamic City Foundation.
**Journey of discovery**

If Shenzhen really does want to work together with the scientists – the project is still at a very early stage – then the researchers will primarily have to help in the development of new business models and administrative structures. By way of example, Professor Weijnen mentions the obstacles in setting up a smart grid, an intelligent and flexible electricity network. “At the moment, the China Southern Power Grid does not allow decentralised generators to return electricity to the network. Their business model is still based on the need to sell as much electricity as possible. There is also friction with the telecoms industry, whose cooperation is needed as well, but which regards the electricity company as a newly emerging competitor.”

There is another challenge: Pingdi will have to collaborate with neighbouring areas in order to prevent pollution-creating industries from being set up just outside the city, which could otherwise lead to pollution reaching Pingdi. This kind of ‘cross-border’ development would also be a novelty. “This is a huge journey of discovery,” laughs Weijnen. Her colleague, Professor Ernst ten Heuvelhof, takes a more cautious line: “It’s difficult enough to get a large project up and running in the Netherlands, never mind in China. Because of the cultural differences, nobody here understands what is happening.”

Weijnen does not believe it will be a drama for her research group if her plan hits the rocks. “This project is teaching us how the game of relationships and interests, known as Guanxi in Chinese, is played.”

Guanxi may sound poetic, but it is a source of headaches for many western engineers. The ‘game’, and the politics of Chinese industry, leads to many misunderstandings and differences of opinion between western and Chinese government bodies.

Tjerk Reijenga, the director of the Chinese department of the Architectural firm KOW in Shanghai, recalls for example seeing at close hand how a major engineering firm from the Netherlands lost a commission for the construction of an ecocity at the last moment. The company had won a competition for the design of the ecocity of Caofeidian (in the Tangshan province), and assumed that it would be hired to flesh out the details of the design. However, it was a Swedish company that won the order, following a visit by the King of Sweden.

‘Let’s give the commission to a group of mugs in the Netherlands’

One of the main speakers at the conference, Slavis Poczebutas, of the Arup building consultancy, talked about his company’s involvement in drawing up the plans for the ecocity of Wanzhuang near Beijing. Some 30,000 people live in 40 villages in the area, which covered 80-square kilometres. “You are taken on for the project, and it then transpires that they have already drawn up a master plan that involves the complete demolition of everything.” Poczebutas wanted to preserve valuable

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In just thirty years, Shenzhen has grown from a fishing village to a city with millions of residents. And the end is not yet in sight.
agricultural areas and certain buildings. Ultimately, the Chinese adopted his ideas only in a few small experimental areas.

Poczebutas is rather cynical about the sustainable ambitions of the Chinese. "There are no real ecocities in China, just small-scale sustainable projects." Nevertheless, the country is attempting to build in a more sustainable way. Cities have recently started to be judged in terms of not just their economic growth, but also their sustainability. "But the standard business model for cities, which is aimed at achieving the 12 to 13 percent economic growth rate per year that Beijing wishes to see, is much easier for them to implement," says Dirk Bekkering, who was employed with KOW China until recently.

"In order to attain such a level of growth, cities are selling their rights to build in new areas to project developers. The project developers in turn put up factories and blocks of flats as they see fit in these areas as fast as possible, in order to quickly cash in. Given that property prices are shooting up, the main priority is to build quickly."

Architect Neville Mars of the Dynamic City Foundation describes the building craze as "the world’s most aggressively profiteering environment". He believes the fast rate of growth makes long term planning difficult.

**Background colour**

If it is not proving possible to build ecocities elsewhere, why should Shenzhen succeed? Perhaps because the current business strategy will lead to a dead end in the reasonably short term. The city is beginning to burst at the seams. "On top of which," says Professor Wang Dong, of the HIT Shenzhen Graduate School, "employees are asking for higher wages and are less willing to work as hard." In his opinion, the city will become less attractive to industries that are low on innovation and low on value. Shenzhen therefore needs to concentrate on innovation and on becoming more attractive for people with good qualifications. This vision is shared by Deputy Mayor Tang. "Pingdi must focus on Research and Development. It will be a very green and pleasant place to work." It is not just economic necessity, but also pride that plays a role. "Shenzhen has an exemplary function in China when it comes to economic growth. A third of all the world’s laptops come from here. We now have to set the example as an ecocity."

This is music to Professor Weijnen’s ears: "I really think that Shenzhen wants to make something of this. This is also evident from the critical questions that they ask."

Still, it comes as something of a shock when a Chinese delegation unveils its plans during the conference. It shows a corridor of industry linking Pingdi with other industrial areas. The drawings may be green, but that does not mean anything, as Mars knows. "Green is their standard background colour," he laughs.

Weijnen says to her colleagues: "It seems as if they are extrapolating their old plans. We have to make sure now that we are sticking to the same script."

**‘Because of the cultural differences, nobody here understands what is happening’**

The Delft plan calls for protecting the culture and architecture of the Hakka people, a minority group, thus giving the ecocity its own distinctive character.
De Jong explains what he thinks the problem is: “The Chinese would prefer to put up high-tech buildings and campuses in the remaining green areas of Pingdi, and to forget about the polluting and dilapidated built-up areas. But they have never expressed a clear view on this. If they go about it in this way, Pingdi will never be an attractive city for knowledge workers. The built-up areas have to be transformed. It’s time for them to lay their cards on the table.”

Two days after the conference, De Jong explains once again what Pingdi can do in order to become a sustainable knowledge city. This time, he is at the city hall. The head of the Shenzhen Urban Planning Bureau is also present. He smiles, “This is a very risky project. It seems as if the foreigners are more enthusiastic about Pingdi than we are.” He also wants the group from Delft to present a prognosis during the following meeting for the economic growth that the ecocity will generate. There are mixed feelings afterwards. But it does at least look as though the researchers have reached the next stage of the game.

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How do you build an ecocity?

Pingdi is not a blank canvas. The area consists of industrial areas and is also home to a large group of Hakka, a local minority. The researchers want to preserve the Hakka architecture as much as possible in order to give the area a strong cultural identity. Moreover, it is a point of interest to them to see how one can carefully edge complex systems like cities, which develop their own dynamics, in a certain direction.

But Dr Wim Ravesteijn of TPM is under no illusions. “China has social objectives, but the importance of the individual does not count for anything at present,” he says. “If the government thinks that residents have to go, then they have to go, especially if they are not official inhabitants of the city. This is still a dictatorship.”

How is Shenzhen intending to deal with the building work and the residents? Deputy Mayor Tang Jie gives a somewhat cryptic answer: “The plans [of TU Delft, ed.] are academic in nature. We’re trying to shape them in our project. However, Shenzhen was designed as an industrial city. No plan has yet been decided upon.”

Ravesteijn sees no reason to abandon the project. “That would be taking things too far. We are all conscious of the ethical aspects. We are involved in internal discussions on the matter.”

De Jong is assuming that if people are forced to leave, they will be compensated. “We have to break away from the defensive European argument that nothing should change, he says. “Most people will be better off when the ecocity is built. Currently, they have a miserable existence as factory workers. The ecocity offers them the opportunity to work in the service sector.”