

## A Tale of Two Low Carbon Cities

### 1 Low Carbon City: China Strategy

With the predominant achievements in economy and urbanisation, the progress of China has been shining since its Reform and Opening Up in 1979. However, in an era of globalisation and economic integration, China has also been facing global headaches such as global warming. According to the 3<sup>rd</sup> assessment report developed by IPCC, for the past 100 years, the average temperature of China has increased 0.5 to 0.8°C, which slightly surpassed the global average increased temperature. Moreover, from 1986 to 2005, China had experienced 20 national wide warm winters, which was especially severe in cities.

China has already aware the importance to solve the roots causing the climate change, among which reducing the emission of CO<sub>2</sub> is one of the top priorities. Although up to now there is no specific national policy named in low carbon strategy, a number of relevant policies have demonstrated the efforts to contribute to a low carbon society in China. Table 1 illustrates relevant documents, relating to building a low carbon society, released by the central government of China.

Table 1: National Documents Relating to Low Carbon City in China

Year Released	Documents
2004	Interim and Long Term Energy Saving Specific Plan
2005	Law of Renewable Energy
2005	Declaration on Clean Development and Climate New Partnership in Asia and Pacific (China, US, Japan, India, Australia and South Korean)
2005	The Joint Declaration on Climate Change between China and European Union
2006	National Assessment Report on Climate Change
2007	China National Plan for Responding to Climate Change
2007	China Technical Special Actions to Climate Change
2007	Renewable Energy and New Energy International Cooperation Plan

Although facing the dual pressures of both economic development and carbon emission reducing, as a promoter of *Kyoto Protocol*, China has proactively taken actions to low carbon cities strategy.

## 2 Shanghai's Low Carbon Economic Practice Area Scheme

No other cities like Shanghai can enjoy such fantastic advantages, a metropolis with perfect location in the Yangtze River Delta, two international airport hubs, strong industrial capacity, and recently the inspiring supports from the central government to build an international financial and shipping centre. As a pioneering city in China, Shanghai has launched Low Carbon Economic Practice Area Scheme in 2008, which selected Chongming Dongtan and Lingang New City as the pilot areas to collect experience so as to provide guidance to the development of low carbon strategies for other places.

However, although the Dongtan eco-city plan has already been planned ever since 2000, for the nearly 10 years planning and discussion, it still seems like a utopia. Lingang New City becomes the second advocator for low carbon dream, difficulties ahead but still struggling to go ahead. The following sections present the Dongtan Utopia and Lingang Dream.

### 2.1 Dongtan Utopia



Figure 1: Location of Dongtan

Source: ARUP (2006) *Dongtan Master Plan*

Dongtan is located in the third largest island of China, Chongming Island. In the Master Plan of Shanghai (1999-2020), Chongming Island is planned to be a comprehensive eco-island of international metropolis, which has also inspired the interest of the investment companies. In 1998, Shanghai International Investment Corporation (SIIC), undertook a study on the 86 km<sup>2</sup> Dongtan and aimed to build Dongtan as a sustainable development demonstration area in Shanghai.

After that, a series of researches have been conducted on the eco-concept of Dongtan by SIIC:

- ◆ Research on Building Chongming Island as an Eco-green Island of Shanghai, 2001
- ◆ General Structure Plan of Dongtan, Chongming Island, Shanghai, 2002

In August 2005, ARUP and SIIC decided to plan an eco-city in Chongming Island, the third largest island in China. Figure 1 depicts the location of Dongtan in Shanghai, China.

The plan aims to build a strip-shaped city with an area of nearly 86 km<sup>2</sup> in Chongming Island, among which 6.3 km<sup>2</sup> has been set as Phase 1, the demonstration area.

By combining urban planning, urban design, sustainable energy management, economic and commercial planning and even community development schemes, Dongtan boasted to build the first eco-city and zero carbon city in the world. Besides, a hydrogen energy grid system, the first electricity in China, has been proposed.

The plan also set nine objectives to realise a truly eco-city:

- ◆ Environmental protection;
- ◆ Social and economic benefit;
- ◆ Low ecological footprint;
- ◆ Water and flood management;
- ◆ Agricultural production;
- ◆ Energy production, use and emission reduction;
- ◆ Green city
- ◆ Accessibility and transport
- ◆ Resource and waste management



Figure 2: Dongtan Eco City Phase 1

Source: ARUP (2006) Dongtan Master Plan

However, after nearly 10 years planning and discussion, Dongtan Eco-city still seems to be a utopia. Although the first phase was planned to be finished before 2010, it still covers with demolished buildings and debris. Figure 3 and 4 depicts the current situation of the Phase 1, which contrast sharply with the fantastic Dongtan Plan in Figure 5.



Figure 3: Debris



Figure 4: Deserted Buildings



Figure 5: Dongtan Plan

Source: ARUP (2006) Dongtan Plan

## 2.2 Lingang Dream



Figure 5: Location of Lingang New City

The Master Plan of Shanghai (1999-2020) sets to build Shanghai as one of the international centres of economy, finance, trade and shipping. In 2009, the State Council clearly released the objective to build Shanghai as an international financial and shipping centre. In 2006, Shanghai Municipal Government formulated *the Eleventh Five-year Plan for the Development of Shanghai Marine Economy*. Nanhui District (merged with Pudong District in 2009) where Lingang New City is located has been set with a function of developing marine economy. In 2007, Lingang New City was identified as one of the key area

for the development of marine economy. Currently, Lingang New City has been selected as one of the three key new cities in Shanghai, with Jiading New City and Songjiang New City.

The above supporting policies has also promoted that the position of Lingang New City. Centred at Dishui Lake, the ring-shape new city (See Figure 6) has also been selected as a low carbon economic practice area. The 500,000 m<sup>2</sup> newly built apartments will be equipped with solar energy water heating system which can greatly save energy and cut down the emission of Carbon Dioxide. According to the Haibo Dai, vice-director of Lingang New City Administration Committee, when the New City will be fully built, 20% consumed energy in the new city will be renewal. Besides, the industry in Lingang New City will also full consider eco-industry. (Shoubin Wang, 2008)



Figure 6: Master Plan of Lingang New City

Source: *Lingang New City Master*

Lingang New City is now trying its best to attract people to live and work there. However, even the property price in Lingang New City is much less expensive than the property price in the city centre of Shanghai, in order to achieve low carbon dream, the eco-apartments are expensive than conventional apartments. When the awareness to the eco-facilities is not high enough, few people will buy a property with a much higher price.

Moreover, although Lingang New City is only 25 km to Pudong International Airport, and 32 km to Yangshan Port, it is 75 km from the city centre of Shanghai. People are reluctant to move to a place where is far from the city centre, as the city centre has incomparable mature service infrastructures. Thus although advertisements have been bombast severely to people, the selling results of those eco-apartments are not ideal as planned.

## 3 Challenging Hurdles

It has been widely accepted that low carbon economy concept has been firstly advanced in

the energy white paper of British government in 2003, namely UK Energy White Paper, *Our Energy Future - Creating a Low Carbon Economy*. But they will never predict the proactive low carbon practice in Shanghai, although sounds to be bitter. For the Dongtan and Lingang cases, planning is not only about technical issues but about policy-making. The following sections analyse the hurdles for low carbon city dreams regarding to the above two “low carbon cities”.

### **3.1 Eco-utopia Challenges Land Policies**

Planning matters closely with policies. Originally, the land use of the proposed Dongtan Eco-city was farm land. The central government of China operates a most strict farm land protect policy, which regulates that one who occupies a square kilometre farm land, a square kilometre should be reclaimed.

Although the operation rights have been assigned to SIIC, the land still belongs to Chongming County. In order to develop the eco-town, the land use type must be changed from farm land to construction land. However, with such a large scale land development for a company, it is nearly impossible for it to get the development permission.

Comparatively, Lingang New City generally have been developed on permitted construction lands, thus it avoids the land issues.

### **3.2 Technical and Financial Traps**

As a new kind of development, Dongtan Eco-city and Lingang New City have encountered great technical hurdles. Aiming to balance economy, society, environment and natural resources, both of the two cases have been pursuing new methods to tackle carbon emission issues. Dongtan seems to be much more audacious, while Lingang illustrates a much neutral way.

Both of them emphasise on compact land use, clean transport, waste management and even clean energy measures such as using wind turbines and solar energy heating system. However, at the current stage, using those techniques may not necessarily lead to an energy-saving results and the cost is still expensive.

Entering 2009, with the world financial crisis wave surging over the globe, it set a great financial challenge for the very two eco-towns in Shanghai. Constrained by cannot convert farm land to construction land, SIIC cannot make Dongtan project profitable at this stage. In order to maintain a high forest cover rate, with a large part of woodland, development company of Lingang New City also eager to develop part of the woodland to commercial use such as SPAs.

### **3.3 International Planning Ideas Conflicts**

Both of the two projects are the results of cooperation between Chinese planners and foreign planners. While pursuing a low carbon dream, the two cases provided excellent platform for those players, but conflicts are obvious.

The international planners brought possible advanced ideas to the two “low carbon cities”, however, when national meets international, when traditional meets modern needs, conflicts undoubtedly occurred. For example, non-motorised transport has been employed in the both of the two plans. However, a very typical situation in China is that with the improvement of income level, people hope to have their own cars. Although the international ideas are good, but how to persuade people to accept those advanced ideas and put into practice becomes another question for the two projects.

#### **4 Low Carbon City Promotion Toolkits for Developing Countries**

From the above analysis, it can be seen that although cities like Shanghai is comparatively advancing than many other cities in China, however, shifting from traditional development way to sustainable development mode is not easy, while climbing to low carbon development ways turns to be especially difficult. The audacious Dongtan Utopia has already been stagnant. The Lingang Dream appears to be more cautious. The following section aims to present toolkits for low carbon city development in China and possibly for other developing countries.

- International Ideas Think-tank

Low carbon city construction is a new mode of sustainable urban development. The above two Low Carbon Economic Practice Areas have all brought in international think-tank. Although in much detailed planning work, the actual planning practitioners are mainly Chinese, because of certain regulations and the familiarity to Chinese situations. The international partners not only bring in advanced ideas but also can provide maintaining experience for the sustainable development of those low carbon cities.

- Governance

Planning matters with policies, while policies matters with governance. Building low carbon cities transcends the traditional way of urban planning and construction. Incentive policies for low carbon cities and low carbon way of life should be promoted. Moreover, in order to more effectively improve governance in terms of low carbon cities construction, strengthening the public and private partnership is another important method.

- Technical Innovation

In order to realise low carbon cities, innovated techniques need to be developed. Although Dongtan case demonstrates to be too audacious, it has developed comprehensive techniques for low carbon city construction, even although which may be still not feasible at this stage. Some of the techniques actually have been employed in other projects.

- Public Participation

However fantastic plans are, without the active participation of the public, the plans will fade. As a developing country, the level of public participation is low in China. Building low carbon cities is also an opportunity for improving the awareness of public participation. The public participation should be started at the very beginning of the planning and through the implementation.

- Local Culture

As a new kind of urban mode, the development of low carbon cities will unavoidably encounter traditional culture. A typical case in China is that people hope to buy their own cars. This is actually not a phenomenon indicating people are not willing to protect the environment, but want to improve their living standard. Only a good combination between the new urban pattern and local culture can low carbon cities be really realised.

## 5 Conclusions

Climate will shape us as how we shape the climate. Entering July 2009, by 28 July 2009, the average temperature of Shanghai has reached 31.6°C, with 11 days higher than 35°C, which has surpassed the highest average temperature in history with temperature records, 30.4°C in July 1994 (Shanghai Meteorological Bureau, 2009). No one likes to live in a burning planet. It is time for us to take measures to counteract the very urgent issue for us. Low carbon cities present the way.

Although the practice in Dongtan sounds to be bitter and Lingang New City is still carrying its steps to march on the way to low carbon city, both of them has accumulated invaluable experience for the development of low carbon cities in China and even other developing countries in the world. As a new urban development mode, the development of low carbon cities itself is a learning process.

As a new urban mode, the development of low carbon cities cannot be realised without the policy supports from the national to the local level. Innovating techniques are also a must to the development of low carbon cities. In order to promote low carbon initiative, the proper public and private partnership is also of great necessity. Lastly, from the experience of Shanghai low carbon city practice, it has been learnt that good practice of building low carbon cities needs step-by-step processes as well as a combination of the local culture and wisdom. However, facing such an era of global warming, urgent measures need to be taken to solve the low carbon issues.

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