



The World's First Carbon Neutral Sustainable City

City

Dongtan, near Shanghai, China

Population

Projected upwards of 500,000 people

Project Start Date

Construction: 2007
Move-In Date:
2010 for up to 10k people
2020 for up to 80k people
2050 for up to 500k people

Annual CO2 Reductions

750,000 tons of carbon per year for 80,000 people compared to 'business as usual'

Annual Financial Savings

NA

Initial Investment

NA

Project Status

Design and masterplan completed

SUMMARY

Dongtan aims to be the world's first purpose-built eco-city. The city is designed not only to be environmentally sustainable, but also socially, economically and culturally sustainable. Its goal is to be as close to carbon neutral as possible, with city vehicles that produce no carbon or particulate emissions and highly efficient water and energy systems. Dongtan will generate all of its energy needs from renewable sources including bio-fuels, wind farms and photovoltaic panels. A majority of Dongtan's waste will be reused as biofuel for additional energy production and organic waste will be composted. Even human sewage will be composted and processed for energy and composting, greatly reducing or entirely eliminating landfill waste sites.

WHAT IS IT?

Dongtan is located on Chongming Island at the mouth of the Yangtze river. The site is situated on 8,600 hectares/86 square kilometers/21250 acres of agricultural land, which is three quarters the size of Manhattan. The site is adjacent to a wetland of international importance and the city design incorporates a 350 hectare/3.5 kilometer/865 acre wide 'buffer zone' between the city and the wetland to minimize the impact of the development. The developed city will eventually cover just 40% of the total site area with the remaining land used for agriculture, energy production or returned to a wetland state.

HOW DOES IT WORK?

- The Shanghai Government is constructing a bridge and tunnel linking Chongming Island to the centre of Shanghai.
- The Dongtan site has been chosen by the Mayor of Shanghai and the Chinese Premier as a site for environmentally-sensitive development and as a demonstration project for China.
- SIIC (Shanghai Industrial Investment Corp), the largest international investment group company owned by the Shanghai municipal government, is developing the site.

- SIIC partnered with Arup, a global design, engineering and business consultancy, to plan and deliver the city.
- All of the proposed measures for Dongtan are tried and tested. The opportunity and ambition with this site is to bring them all together in a brand new development.
- The city will be completed in 3 phases:
 - Phase 1: one square kilometer (100 hectares/250 acres) will be developed to accommodate up to 10,000 people by 2010
 - Phase 2: 6.5 square kilometers (650 hectares/1,600 acres) will be developed to accommodate 80,000 people by 2020
 - Phase 3: 30 square kilometers (3,000 hectares/7,415 acres) will be developed to accommodate 500,000 people around 2050
- Who will live in Dongtan:
 - The social sustainability plan includes integrating the current population (a small fishing community and agricultural workers) into the city design rather than displacing them.
 - The strategy for attracting and determining who will make up the additional population and how they will move into Dongtan is still being developed; however, in order to be socially sustainable, the population will need to come from a wide range of socio-economic backgrounds, as there will be jobs for every person able to work
- Components:
 - City Design: The city is being designed as three village neighborhoods concentrated at the southern tip of the site. The infrastructure (roads, public transport, schools, hospitals, commercial areas, green spaces) will be designed to encourage inhabitants to travel by bicycle or public transport rather than car. These 'villages' meet to create a city center, where commercial activities will be concentrated.
 - Transportation: City will be linked by a network of pedestrian walkways Car-Pool: an intranet service will connect people who want to share a car and forecasts travel times. Only zero-carbon vehicles will be allowed to drive within the city.
 - Pollution-free buses, trams or water taxis, powered by fuel-cells or other zero-carbon technologies will run between neighborhoods.
 - Traditional motorbikes will be forbidden, replaced by electric scooters or bicycles.

- Buildings:
 - The buildings are dense, but not more than eight stories high.
 - Turf and vegetation cover the roofs 'creating green roofs', a natural form of insulation that also reduces run-off and recycles wastewater.
 - Photovoltaic panels and small-scale windmills will be integrated into the building designs to provide up to 20% of the power.
- Waste and Energy:
 - Up to 80% of solid waste will be recycled.
 - Organic waste will be reused for compost and energy generation, catering for part of the town's electricity requirements. Rice husks, which are a plentiful waste product in China, will be burned in combined heat and power (CHP) plants to generate heat, cooling and electricity.
 - On the outskirts of the city, carefully positioned wind turbines driven by the sea breeze, produce electricity.
 - An energy center will manage generation via wind turbines, bio-fuels and recycled organic material, and also serve as an information resource centre for inhabitants and visitors.
- Flood Protection
 - There are existing flood walls around the site and space has been built into the design to increase the height of the defenses should sea level rise.
 - Protective cells have been designed within the cities basements as an additional measure against flooding.
- A bridge and tunnel and high quality road are currently being built by the Shanghai Municipal Government to connect Chongming Island and the Dongtan site to the Shanghai mainland.

ENERGY EFFICIENCY

Dongtan expects to use 64% less energy than a comparable city of its size built in a 'business as usual' way.

NEXT STEPS

The master planning and design of the city is complete. Construction has not commenced on the site. It is expected to begin sometime this year. Up to 10, 000 people will live in the city from completion of the first phase, which is planned for 2010.

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The facts and figures in this case study have been provided by the highlighted city governments to the Clinton Climate Initiative.