



# Overview of the Dongtan project

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# Overview



1. Background: The Dongtan ecocity
2. Our research on Dongtan
3. Dongtan research network

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# What is an ecocity?

- Response to climate change - towards a low carbon society
- New paradigm for cities: China, as well as in the UK, India, Abu Dhabi, etc.
- Key features:
  - Energy from renewables
  - Zero-emission transport
  - Water treatment and recycling
  - Compact city: low rise & high density
  - Light pollution control
  - Near zero landfill
  - Biodiversity in landscape

# Chinese context:

“Urban population is to reach 1.12 billion by 2050 – this is a shift of more than 600 million people from rural to urban.”

*Guangming Daily*



# The Dongtan ecocity

- Located on Chongming island
  - 8,400 hectares (size of Manhattan) in the Yangze river
  - Dongtan site 84 square kilometres
- Located in ‘symbioses’ with one of the most important wetland resorts for birds in Asia
- Dongtan project commissioned by Shanghai Industrial Investment Corporation (SIIC)
- 2010 - demonstrator phase:
  - <10.000 people in the city completed by Shanghai EXPO 2010
- 2020 – 80,000 residents & 51,000 jobs
- 2030 - 500.000 residents

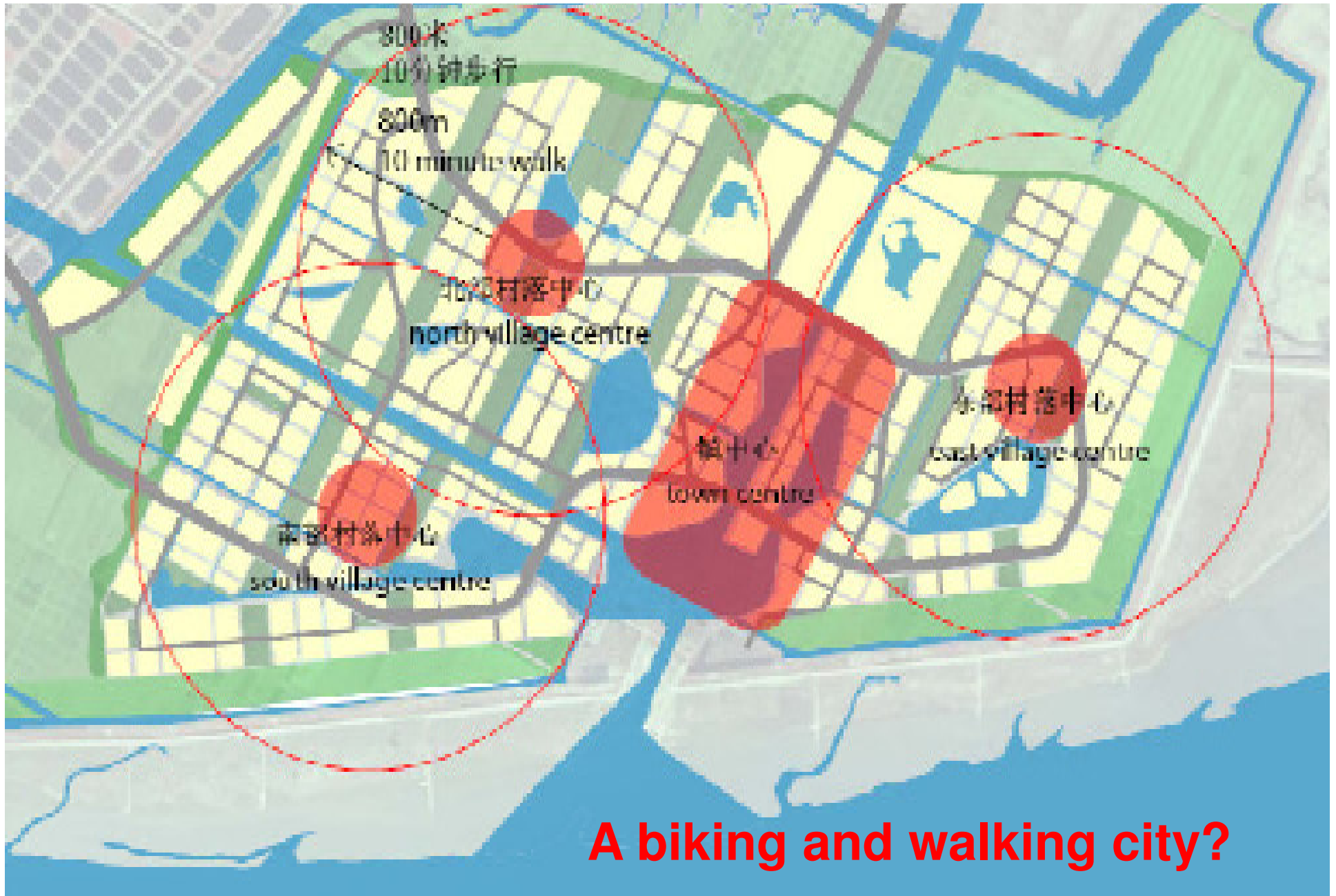




Developed by 2020







# The Dongtan mega-project: vision and size

- “aims to achieve environmental, social and economic development simultaneously. The improvement of one will not be detrimental of another” (Shanghai Industrial Investment Corporation, client of the Dongtan project).
- “The cost of building the city, whose scale and complexity will dwarf the 2008 Beijing Olympics and whose eventual population will be a third the size of Manhattan’s, will run into billions of dollars”.  
(SustainAbility Tomorrow’s Value Network, accessed Jan, 2008)

# Dongtan – a vision of the urban future

*"Dongtan was a rare chance to demonstrate that growth could happen a different way."*

**Lead planner Alejandro Gutierrez, Arup, *Wired* 2007**



*"This city will become a showpiece for the rest of the world. With London set to grow so much the methods we use in Dongtan will become extremely relevant to London."*

**Peter Head, Dongtan Project Director, Arup 2007**

# The Dongtan project – the client

- Shanghai Industrial Investment Corporation (SIIC)
- China's second largest building company
- Client and political environment committed to building the ecocity
- Owns the land: Dongtan

# The Dongtan project – the designer

- Arup – global design consultancy company
  - Involved to help with bird sanctuary 2004
  - Asked to develop Dongtan Masterplan (sustainability guidelines for urban development)
- Partnering Agreement with SIIC – November 2005
  - Extend this approach to other cities in China
  - Project goal: develop masterplan and planning approval within 15 months
  - Arup achieved this goal – 3 months early

# Arup's proposal and masterplan

- Plant to build Dongtan in 3 stages leading to construction of integrated eco-city
- Client asks for 100% local renewable energy sources from the start
- SIIC approved Arup's master plan in summer 2006
- Building starts 2008

# Arup's approach – 'integrated urbanism'

- Dongtan is a huge design and systems integration challenge
  - Recombination of existing technologies
- Management approach
  - Created from Arup's deep understanding of cities and sustainable development
- Matrix structure to cope with interdisciplinary complexity
  - Cross cutting themes – social, economic and environmental
  - Different physical components of city – transport, built environment and social services
- Planning addresses the design, construction and operational phases over 30 years
  - Defined packages of work delivered to an agreed timescale

# Arup's innovation

- *'This is a story about the management of total, serial innovation involving a huge range of skills, people from many different cultures and with teams located in many countries, but all with a common creative purpose.'* (Peter Head, 2007, Dongtan Project Director)





# The next breakthrough project for Arup?



*Urban designer, Arup,  
Jan 2008: "Dongtan is  
the next Sidney Opera  
house for Arup in  
terms of importance"*

# Will it scale?



- Apart from the demographic and environmental pressures, there are commercial incentives, too
- “They are also saying, that if we get it right, we can sell this to the rest of the world”. (P. Head, Arup)

- <http://www.youtube.com/watch?v=wvaCOExhHhE>
- <http://www.youtube.com/watch?v=Ej5IVXI-Jyc&feature=related>
- <http://www.youtube.com/watch?v=wvaCOExhHhE>

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# Our research - rationale

- Dongtan is a model for other eco-city mega-projects
- SIIC and Arup are using the lessons learnt from Dongtan
- Replicating practices and processes on other eco-cities in China and elsewhere in the world
- Business model or template for ecocity design

# Research questions – the evolution of client and designer capabilities

- Apply to SIIC and Arup
- 1. What capabilities (skills and knowledge) and organisation were developed to undertake the Dongtan design?
  - Integrated design?
  - Project management?
  - Dynamics within the project team: how was the team assembled?
- 2. How are capabilities developed and replicated on other ecocity projects in China?
  - How are lessons being captured and transferred from Dongtan to other ecocities projects in China?
  - How is performance improved over time as more projects are taken on?
  - Implications for scale and growth of business model?

# Theoretical aspects of research

- Bodies of literature:
  - Capability life cycles
  - Co-production of knowledge: client-consultant partnership
  - Organisational learning and replication
  - Project-based firms
- Focus on co-evolution of client and consultant capabilities and replication across future projects

# Mixed method

- Interviews with stakeholders in Arup and SIIC
  - Study of primary source documents (archive)
  - Performance of sub-projects and overall project
  - Case study in context of other ecocities developments (i.e. Masdar, Chula Vista)
- Social Network Analysis
  - Study complex set of relationships between members of Arup's design team (including suppliers) within one project
  - Evolution of network over time



# Phases of research

- Year 1 (Jan-Dec 2008) – Dongtan approach
  1. 5-10 fly-by interviews
  2. 30-50 interviews (over 12 months)
  3. On-line survey
- Year 2 (Jan-Dec 2009) – Replication of approach
  - Other phases of Dongtan project
  - Other ecocity projects in China

# Initial findings

- Challenge – co-evolution of client-consultant capabilities
- Dongtan project
  - Arup team grew from 5 to 150 people (30 specialists each with a team of 3-4 people)
  - Learning in 3 phases within the Dongtan project
- SIIC and Arup
  - 4 new ecocity projects in China
  - 6 more ecocity projects this year
  - 30 potential ecocity projects in China

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# EPSRC Dongtan research network

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- <http://www.ecocit.org/main.php>