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
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
A biking and walking city?
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
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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

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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