

Shanghai Ecological Building Exhibition 2006

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Abstract As a Chinese-German cooperation project the sister cities Shanghai and Hamburg will together prepare and carry out the Ecological Building Exhibition Shanghai to be opened to the public at the end of the year 2006. This project is based on the positive experience of the Solar Building Exhibition Hamburg 2005, which is part of an European cooperation project, where 12 partner cities in 5 EU-countries participate in the European Solar Building Exhibition (see also: www.eu-exhibition.org). This exhibition is centrally coordinated by ZEBAU (Center for Energy, Building, Architecture and Environment), a public-private institution of the city of Hamburg. ZEBAU itself is founding member of SINOBAU e.V., a non profit association aiming at promoting energy efficient building in China.

Through a demonstration of the possibilities of energy efficient building and the usage of renewable energy sources the Ecological Building Exhibition Shanghai 2006 will contribute to a sustainable urban development of Shanghai. It is planned to jointly develop an exhibition concept, to select appropriate projects and to accompany and supervise every stage from planning to construction until the exhibition is held in 2006. Furthermore it is envisaged to construct a Chinese-German Centre for Energy and Resource Management (CERM) which shall promote energy efficient building techniques and renewable energy technology during and after the exhibition.

The lecture will introduce the main ideas behind this cooperation project and give a summary with examples of the Solar Building Exhibition in Hamburg as well as the European Solar Building Exhibition.

1.Introduction

The People's Republic of China is by far the world's largest consumer of carbon. Over 70% of Chinese electricity is produced by coal power stations, mostly working with outdated environmental technologies, if at all. The unfiltered exhaust fumes of cars and the small carbon stoves in private households add to this as well. The air is dirty, towns lie under a haze, breathing falls heavily. The air must get purer.

If the Chinese economy is to continue to grow at the present speed, China will soon overtake the USA as the world's largest carbon dioxide issuer, with disastrous consequences for the global climate. Therefore, the rest of the world should have a vital interest in any measures that could help to stop this trend. The important question is: how to achieve this most effectively? The answer lies in building energy efficiency. Why? As hardly anyone notices, the ratio of energy consumption for buildings compared to the overall energy consumption in China has risen dramatically in the last 25 years. This has to do with the unprecedented construction boom in the same time span. In China right now the incredible amount of 1.6 – 1.9 billion m² of new building space is under construction every year (the current overall floor area of all buildings amounts to about 38 billion m²). In other words, during the last years and during the next

decade to come, the floor space under construction in China in every single year equals about half (!) of Germany's existing overall residential floor area.

This has serious implications because new buildings lack even the most basic measures to improve energy efficiency (Chinese buildings consume between two to three times more energy per square meter than comparable buildings in Germany). Unlike technical appliances buildings have life spans of at least 50 years and can't be substituted easily to adapt to new standards. As a consequence year by year a huge amount of floor area in China is "locked" in a state of energy inefficiency for many generations to come.

The Chinese government has realized the gravity of this development and has not only begun to implement building energy efficiency standards but is also preparing to adopt a quota system to promote the use of energy from renewable sources.

The time is ripe to engage in building energy efficiency in China. This is not only a key factor in reducing greenhouse gases on a global scale but also an area where this goal can be achieved far more easily and quickly than in other domains like renewable energies. The main obstacles are a lack of public awareness and local know how. To change this, building exhibitions have proved to be very effective.

2.Short Description

A building exhibition is an ideal means to promote energy efficient construction in China because it incorporates all aspects of energy efficient construction: ecological urban planning, green architectural design, innovative techniques for heating and cooling and the possibility for the large public and investors to get convinced through concrete experience.

In the frame of the first "Ecological Building Exhibition" in China it is planned to build up a new area of several hectares not only with energy efficient and ecological buildings for housing and business but also with an intelligent and sustainable infrastructure concerning amongst others traffic, energy, water and waste management.

The buildings will be developed by German and Chinese planners in close cooperation and built by construction companies and craftsmen from Germany and China.

After their completion at the end of 2006 more than 50 different house types can be inspected in about 10 weeks during the "Shanghai Ecological Building Exhibition". After the end of the exhibition, the houses will be occupied by their owners and users.

The energy supply of the new area should be covered by Renewable Energy Sources to a great extent – this will be an area of Shanghai with almost zero emission of CO₂.

As a core of the building exhibition it is planned to create a "Centre for Energy and Resource Management" (CERM) on the grounds of the exhibition, which shall promote energy efficient building technologies and renewable energy technology during and after the exhibition. Among the users of the Energy Innovation Centre will be

- architects and planners
- energy experts
- building suppliers

- construction companies
- research institutes
- politicians and authorities

The centre shall be used to hold seminars, to conduct workshops, to provide information about every aspect of energy efficient construction in China as well as in other countries, to exhibit energy efficient building materials, to establish contacts etc. In other words, it should become an indispensable information and competence centre for everybody interested in energy efficient construction in China.

3.Location

Why choose Shanghai as location for the first Ecological Building Exhibition in China?

- Although Shanghai does not belong to the heating area of China, the index of energy consumption for residential buildings is among the highest. This is due to the excessive and widespread use of air conditioning and at the same time almost complete lack of insulation.
- The energy consumption of 2000 has reached 54 million tons, among which coal represents 68% of the total primary energy used in Shanghai. The high proportion of coal consumption has brought serious adverse environmental impacts in Shanghai. Therefore local energy policymakers have launched regulations and made new policies to adjust the energy structure.
- In Shanghai solar energy is now mainly used for water heating. More than 65000 solar collectors are installed in Shanghai (equivalent to about 130.000 m²). But there is no example of integrated solar application technology in buildings (lighting, heating, cooling etc).
- Shanghai wants to become a global city of the future and to stay the technologically most advanced city in China (always being challenged by cities like Beijing, Tianjin or Shenzhen)
- The building energy efficiency standard for Shanghai and the Yangzi-region (JGJ-134-2001) has been put into effect and shall be enforced more rigorously than in other regions. Beginning with 2005 every new building has to adhere to the existing standards which implies theoretically at least an insulation of the building envelope. For 2003 it is estimated that about 3 Mio. sqm. of new building space will be insulated (about 5% of the total construction activity in Shanghai).
- The World Exhibition 2010 will be held in Shanghai and is already casting its shadows. The responsible authorities are completely aware that they have to start now if they want Shanghai to serve as an example of a sustainable mega-city of the future.
- Shanghai is certainly the richest and most international city in China and therefore an ideal starting point and multiplier for innovative concepts.

4.Targets of the Solar Building Exhibition

- Promote energy efficient construction in China in order to significantly reduce the emission of greenhouse gases through
 - ncreasing public awareness
 - technology transfer in the field of sustainable building and urban planning in China
 - “best practise” examples for planners and administrations
 - offering Chinese developers, construction companies and craftsmen an easier access to new

technologies and expertise

- Providing architects, planners and technology suppliers from Europe with an efficient means to enter the Chinese market for energy efficient construction
- Opening future perspectives for all participants, like for example follow-up-sales - Chinese citizens will have the possibility to buy the same type of houses they saw at the exhibition and have them built later at their own plots somewhere else

5.Benefits

The benefits of the Building Exhibition are manifold, ranging from the raising of public awareness for ecological problems to know-how transfer, business development and – last but not least – a significant improvement of the local and global environment.

5.1 Public awareness

- Concrete experience: Although more and more Chinese know of the advantages of energy efficient building they often can't believe it really works or is indeed a feasible option for China. At a building exhibition they get the "feel" of energy efficient construction, they can see it works and – very important – they see that it even goes along with nice architecture and a better room climate.
- Economical arguments: With the help of intelligent simulations it can be demonstrated how much energy and consequently money energy efficient buildings are able to save compared to conventional buildings.
- Large variety: A building exhibition can offer a wide variety of different low-energy and solar buildings so that for every taste and need there should be a suitable building.
- Innovative technology: Chinese are especially fascinated by innovative technology. In a building exhibition all new techniques for energy-optimised cooling and heating, innovative building material and good urban planning concepts as well as Renewable Energies (RE) can be demonstrated effectively.
- Education: The planned Energy-Innovation-Centre of the Building Exhibition offers excellent opportunities for professional education of Chinese planners and craftsmen.

5.2 Contribution to energy-related policies and knowledge transfer

- The experiences of the Building Exhibition can contribute to create a genuine Chinese way of energy efficient building.
- The Building Exhibition can serve to evaluate current Chinese standards, regulations and policies on building energy efficiency as well as help with the formulation of new and more advanced standards.
- Other Chinese municipalities will inspect the “Shanghai Solar Building Exhibition” and be motivated to copy that concept in their own town or province.

5.3 Business development and cooperation

- The multinational project of the Building Exhibition contributes to cross-border development and the implementation of innovative concepts and offers many different opportunities for multinational cooperation. This also refers to building technologies that make sustainable planning and construction measures easier.
- Hundreds of regional SME's will erect the buildings - supported by universities and experts

- European producers and construction companies get direct access to the Chinese market – they are supported by the project partners and the Shanghai administration.
- The exhibition offers excellent possibilities for trade – for example producers of building materials have the opportunity to sell their products to Chinese construction companies.
- The exhibition offers new marketing concepts for RES companies, producers of innovative building materials, planners etc. They can present their products or works at the “RES Fair”.
- Investors will be informed about the building projects and the investment opportunities. Each exhibitor, key actor or participant can present his investment offers on the exhibition web page.
- Chinese city planners, architects, engineers and craftsmen will be invited to workshops and events.
- An internet-based information system will present each stage of the development and provide further information on Chinese regulations and the Chinese market.
- Chinese planners, architects, craftsmen, construction companies and manufacturers will be motivated to join that innovative expanding market.

5.4 Improvement of the environment

- The Building Exhibition will contribute to a healthier urban environment in Shanghai.
- At the same time it will contribute to the reduction of green house gases and therefore to the protection of the global climate
- The exhibition will serve to demonstrate and promote innovative solutions for every aspect of urban infrastructure from innovative solutions for traffic systems (car-sharing-stations, solar bikes, public traffic) to waste and water management systems.

6.Target Groups and key actors

a) Target groups:

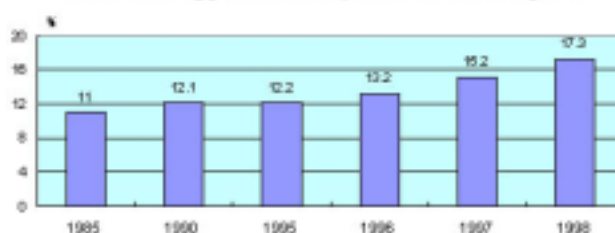
- politicians, civil servants
- city planners, architects, engineers
- building industry and the craft
- energy industry
- investors
- families/citizen and residents
- press, TV, broadcasting

b) Key actors:

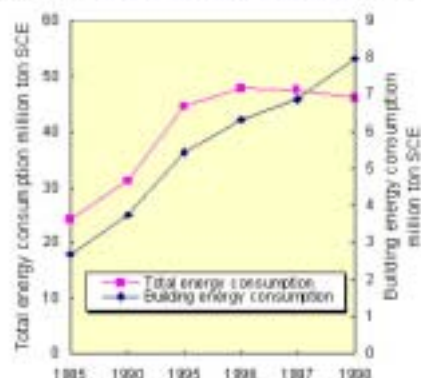
- government
- municipal authority, politicians
- city planners, architects, engineers
- universities
- building industry and the craft
- energy supply industry
- relevant chambers (commerce, architects, engineers, crafts)
- investors

7.Facts

Proportion of building energy consumption in total energy consumption of Shanghai



The increase speed of building energy consumption is faster than that of total energy consumption



上海 2006 生态建筑展览

致力可持续城市发展

作为中德合作项目之一，定于 2006 年底向公众开放的上海生态建筑展览会由上海和它的友好城市汉堡共同筹备。该项目将立足于 2005 汉堡太阳与建筑展览的成功经验。2005 汉堡太阳与建筑展览是一个欧洲合作项目的分项，该项目有 5 个欧盟国家的 12 个城市共同参与欧洲太阳与建筑展览（参见：www.eu-exhibition.org）。2006 上海生态展现主要由汉堡的一家半公立机构 ZEBAU（德国能源、建筑、设计和环境中心）进行协调，它也是在中国推广高能效建筑的非盈利性组织德中建筑节能技术合作协会（SINOBAU）的创建成员之一。

通过演示高能效建筑的多种形式和可再生能源的利用，上海 2006 生态建筑展览将推动上海地区的可持续城市发展，并计划在 2006 年展览召开之前，建立一种新的展览概念，并选择一些合适的项目，进行从规划到建造的全程跟进和监督。此外，中德双方期望在展览期间和展览结束后建立一个中德能量和资源管理中心（CERM），该中心将促进两国高能效建筑技术和可再生能源科技的应用和交流。

本演讲将介绍这个合作项目背后的主要观念，并举例总结汉堡太阳建筑展览和欧洲太阳建筑展览。

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