The Chinese central government’s main targets for 2006-2010

• putting people first
• change the concept of development
• carry out the “five balances” *of development
  - between urban and rural
  - among regions
  - economic and social
  - man and nature
  - domestic development, opening to the outside world, and world development
• earnestly shift socio-economic development onto the track of all-round coordinated and sustainable development

* The meaning of the Chinese word 统筹 is closer to “plan as a whole”, integral

People’s Daily Online, October 10, 2005
Urbanization can be seen as an essential tool for economic development and poverty reduction. From 1980 to 2001, 400 million people were lifted out of extreme poverty in China. During the same period, nearly 300 million people moved to the cities. The urbanization rate currently stands at 1.4 percent, which implies that about 20 million farmers become urban residents each year. If the urbanization drive maintains this speed, Chinese cities and towns will absorb about 400 million new inhabitants in the next 20 years.

“China’s rapid economic growth over the past 26 years has been called a miracle, with GDP growing at an annual rate of 9.4 percent.”

UNDP China 2005

Since the late 1970s, when Deng Xiaoping uttered his famous words that “getting rich is glorious”, the economic structure of China has undergone a series of reforms to make way for “socialism with Chinese characteristics”.

Starting in the early 1980s, the Chinese government established five Special Economic Zones, characterized by investment friendly regulations, such as reduced or eliminated customs duties and enterprise income tax. Other cities and regions followed to participate in the competition to attract foreign investment and the central government’s attention.

Today, either an Economic and Technical Development Zone, a Free Trade Zone or a Hi-Tech Development Zone is to be found in most of the larger Chinese cities. These have largely transformed the urban landscape and shaped the image of the modern Chinese cityscape.

China Internet Information Center 2006
UNDP China report 2005
"Approximately two billion sq m floor area is constructed annually, which almost accounts for a half of the annual constructed floor area all around the world. The newly constructed buildings and the 40 billion sq m floor area of existing buildings in China, not only influence the sustainable development of China, but also effect on the world economy and the climate change. The year 2006 is the first year of the Chinese 11th Five-Year Guidelines of social and economic development. Our main task is to reduce the energy and resources consumption in construction."

Qiu Baoxing, Chinese Vice Minister of Construction February 16 2006

In 2005, China used 26 percent of the world’s crude steel, and 47 percent of the cement.

Worldwatch Institute 2006

Cement output in China 1990-2003 (million tons)
Global Environmental Institute 2005
“If the last century was the American century, this one looks to be the Chinese century.”

Lester R. Brown, Earth Policy Institute 2006

With increasing competition from cheaper labor markets China is now attempting to shift from a manufacturing economy to an innovation economy.

Within the environmental and energy sector, necessity combined with economic capabilities could allow China to leapfrog ahead of more developed countries.

The 2008 Beijing Olympics have become an opportunity for the government to try out new "green" technologies and to develop infrastructure that will meet long-term environmental goals.

At Dongtan on the Chongming Island near Shanghai, Arup and the Shanghai Industrial Investment Corporation is planning the world’s supposedly first sustainable city on 630 hectares of land. The first phase of this "eco-city" is planned to be completed as a demonstration for the Shanghai Expo 2010.

These and other similar projects may have the capacity to define the future of sustainable urban development not only in China but across the globe.

Arup design and business consulting firm 2006

People’s Daily Online, October 10, 2005
“The Ecological Footprint is a resource management tool that measures how much land and water area a human population requires to produce the resources it consumes and to absorb its wastes under prevailing technology. […] Today, humanity’s Ecological Footprint is over 23% larger than what the planet can regenerate. In other words, it now takes more than one year and two months for the Earth to regenerate what we use in a single year.”

Global Footprint Network 2005
Energy consumption in total in China
(10,000 tons of Standard Coal Equivalent)

China Statistical Yearbook 1996, 2005

Energy Consumption by Sector in China 2003

- Industry
- Residential consumption
- Transport, storage, postal & telecommunication
- Farming & forestry
- Wholesale, retail trade & hotel, restaurants
- Construction
- Others

China Statistical Yearbook, 2005

Energy consumption in total in China
(10,000 tons of Standard Coal Equivalent)

China Statistical Yearbook 1996, 2005

1994
170,942.58
2003
122,736.85

Challenges / Energy Consumption

Challenges / Energy Consumption
“Energy consumption by air conditioners in the summer has become a main cause of severe electrical power shortage.”
China Development Gateway, April 12 2006

Economic growth seems to equal increased private consumption of commodities such as air-conditioners, refrigerators and cars. The car sales have rocketed in China during the past decades. The 17 million cars account for one third of China’s oil import today.

Energy Information Administration 2005
Worldwatch Institute 2006

Number of air conditioners per 100 urban households in China 1990 - 2003
China statistical Yearbook 2004
“Experts estimate that if new buildings and existing buildings in China all conform to advanced energy conservation standards by 2020, their energy consumption would drop by an equivalent of 335 million tons of standard coal per year, compared with doing nothing at all. That’s about one fifth of China’s annual energy consumption.”

China Daily, June 14 2004
“By 2020 China is expected to become the world’s largest oil consumer, with total projected oil consumption of 27.6 million barrels a day compared to 26.4 million barrels a day consumed in the United States.”

World Resources Institute 2004
Coal makes up 65% of China’s primary energy consumption, and China is both the largest consumer and producer of coal in the world. China’s coal consumption in 2003 was 1.53* billion short tons, or 28% of the world total.

*1.39 billion tons
Energy Information Administration 2005

China produced 35 percent of the world’s coal last year, but reported 80 percent of the total deaths in coal mine accidents, according to statistics with the State Administration of Work Safety (SAWS). This means that coal mining has become the most deadly job in China.

China Daily Online November 13 2004
“16 of the 20 most polluted cities in the world are in China.”
World Bank 2005

China is the world’s second largest emitter of the climate-altering carbon, at 1.0 billion tons annually or 14 percent of the world total.
Worldwatch Institute 2006

Carbon emissions in China, Europe and the United States, 2004, and increase 1990-2004 (million tons)

Worldwatch Institute 2006
China has just 8 percent of the world’s fresh water to meet the needs of 22 percent of the world’s population. More than half of China’s national water resources are used for agriculture, which now produces only around 15% of GDP. High water consumption and low efficiency of agriculture has led to over-exploitation of water resources as well as to ecosystem degradation.

China Development Brief 2006
“More than 75% of the waters in rivers flowing through China’s urban areas is unsuitable for drinking or fishing.”
OECD 2005

Contamination of fresh water resources with industrial, agricultural and human waste has been a problem in China for a long time. Spills and leakages, mainly from industry, are major causes of water pollution.

The government’s response is implementation of environmental laws, monitoring systems and construction of wastewater treatment facilities in both urban and rural areas. Still facing considerable challenges, the government has been successful in giving more and more Chinese access to clean drinking water.

UNEP 2006; OECD 2005
China has set a goal to halve, by 2015, the proportion of people without sustainable access to safe drinking water and basic sanitation. Domestic use still accounts for only a relatively small proportion of total water demand, but that demand is expected to rise with growing urbanization. City dwellers with showers and flush toilets are likely to use more water, although price reforms are set to deter the increase. But with a doubling of urban inhabitants with access to tap water, a doubling of the total domestic water consumption will follow suit.

“The construction and management of the toilets of a city reflect the civilization of a country and also reflect the comprehensive strength of a country and living standard of the society.”

Ji Lin, Deputy Mayor, Beijing, World Toilet Summit 2004

The rapidly increasing urban population in China is placing enormous demands on urban infrastructure. Water supply, sanitation services and treatment plants have to keep up with residential and commercial development. While modern amenities such as showers and flush toilets constitute obvious components, many urban dwellers regularly use public toilets.

In the city of Liuzhou, with approximately 1.3 million inhabitants, 75 percent of the population use public toilets, and about 15 percent do so on a daily basis. Seven percent of the population depends entirely on public facilities, lacking toilets and running water in their homes. It is for these people where access to decent sanitation has a real impact in terms of health and daily life.

Shanghai has no less than 2,085 public toilets, half of which are located downtown. But for World Expo 2010, the city is set to build more than 600 new public toilets to ensure the provision of a toilet every 300 meters for the coming visitors.

Shanghaiist Website 2005, World Bank 2006
China has rapidly become the world’s largest solid waste generator. Urbanization, urban population growth, increasing affluence and consumption are the driving forces behind this development. During the course of the next 25 years, China will need to develop systems to deal with 2.5 times more waste than current levels, according to estimations at least 480 million tons per year.

World Health Organization 2006, World Bank 2005
“China needs to move up the ‘waste management hierarchy’ promoting waste minimization, reuse and recycling, before other waste disposal methods are pursued.”

World Bank 2005

Less than 20% of urban waste in China is properly disposed of according to international standards for sanitary landfills. This is the cause of pollution of the soil and groundwater, as well as breeding grounds for disease. Landfills also occupy valuable urban land, thus the recycling of waste and clean-up of brownfields are major challenges crucial to future urban development.

In many Chinese cities, waste collection and recycling on the local level is handled by waste pickers with bicycle carts. There are about 2.5 million waste pickers. Many of them are migrant farmers who are willing to take on this job at the bottom of the social ladder.

There are evident hazards inherent to the job, and there is a need for more efficient solutions to the growing amount of urban waste but this low-tech version of recycling is an important part of sustainable waste management in China.


Annual amount of waste per inhabitant in China & Denmark, 2004 (tons)

- Recycled waste

Danmarks Statistik 2005, China’s Agenda 21 2005
In 2005, the number of rural migrant workers seeking employment in cities and coastal areas reached 140 million, according to official figures.

**Migrant workers from the countryside comprise a large share of the increase in the urban population, and constitute the low-cost labor force literally building the cities. Migrant workers are typically employed in low-skilled service sectors and in the construction industry, working long hours for low pay and with little security.**

Due to the Hukou (household registration) System they cannot secure permanent residency in the city, and are often deprived of access to education, healthcare, and social security.

However, earlier this year, the State Council officially announced that it will provide a guarantee of protection of migrant worker’s rights and interests, but the “problem is how to ensure the policies to be earnestly implemented, which needs government’s supervision and migrant workers’ awareness of safeguarding their own rights.”

In spite of often tough conditions, the economic benefits of migrating to the city are still substantial compared with remaining in the countryside. One month’s salary in the construction industry can equate one year’s earnings from farming.

Gittings, John 2005, UNDP China 2005
China’s middle class accounts for around 12 percent of the population, according to a survey by China Academy of Social Sciences in 2005. The study’s definition of middle class citizens are people earning more than 5000 Yuan per month, or about 497 Euro; with a bachelor’s degree or there above; and who works as a civil servant, company manager, technician or private business owner. This number is expected to double to 25 percent by 2010, and reach 40 percent in 2020.

This development is followed by changing consumption patterns, particularly amongst the younger generation born out of the one-child policy, since 1977. They are known to be individualistic and focused on entertainment. For this group and the young urban professionals, shopping malls and the fitness centers have become prime venues. They are “driving a shopping centre construction boom throughout the country”.

In the past decades, the number of students and graduates from the country’s universities has been growing steadily. Today, China has 1.7 million recent engineering graduates, compared with 700,000 in the United States.

Business Week, 22/29 August 2005
China’s socio-economic development has contributed to the general improvement in health in the overall population, but there are increasing gaps and inequality among the people. The main difference is between city and countryside, where the health indicators in all aspects are much better for the city dwellers.

Economic restructuring and commercialization of state hospitals now obliges the individual to pay the main portion of the medical treatment fees. In contrast to the former system with barefoot doctors, centralization of the hospitals also burdens patients with increased travel expenses. This places economic pressure on patients in a situation where only one quarter of the urban population and one tenth of the rural population has medical insurance coverage.
The general improvement in people’s living conditions in China also involves an increase in living space. Between 1978 and 2003, living space per person in the cities more than tripled, from 6.7 sq m to 23.7 sq m. The government’s efforts in raising minimum living standards have as such proved successful.

Old neighborhoods of lane houses without water and sanitation are being replaced by residential compounds, fully equipped with modern facilities. They epitomize the dream of the good life for young urbanites.

But the ambition of improving living standards to Western levels may prove to be quite a heavy economic burden. Since 2003, housing prices have gone up with 50-70% in China’s larger cities. With salaries still at modest levels compared with Western counterparts, the result is that many house buyers spend 50-80% of their income on down payments and mortgages – where they become “mortgage slaves”.

China Statistical Yearbook 2004

Shanghai Daily Opinion, March 17, 2006
“In the decade leading up to 2001, the overall length of road constructed in China only increased by 30 per cent while total road passenger volume and road cargo volume went up by 120 per cent and 46 per cent respectively. The number of cars on the roads over the same period more than quadrupled from 15 million to 68 million.”

Shanghai Star, April 12 2006

The Chinese government’s response to the congested roads is to build 85,000 kilometers of highways by 2020, according to “The National Highway Network Plan”.

A more comprehensive view on the future of transportation is reflected in various public transport projects. One example is the Bus Rapid Transit, a high-speed bus system that “combines the single corridor quality of rail transit with the flexibility of buses”. It is cheaper than rail, and faster to construct. Apart from the Bus Rapid Transit project, the extensive plans for public transport in Chinese cities also include the construction of light rail, subways and expanded heavy rail systems. In Shanghai, for instance, four subway lines will be added to the three existing today and a total of 460 km of railway lines are planned to be operational by 2010.

China Watch 2006, Global Environmental Institute 2005
Due to the high speed of urban development in China, two opposing trends of land use can be observed simultaneously. One is extreme densification of the city cores, the other expansion into the urban hinterland, rapidly reducing arable land in the metropolitan regions. Beijing as an example has seen a reduction of farmland from 413,000 ha in 1990 to 26,000 ha in 2003.
All urban land in China belongs to the State. In an age where land is both scarce and valuable, it becomes an excuse for local governments to appropriate land-use rights from residents and sell these rights to real estate developers. These actions have caused disputes, which generally result in giving residents economic compensation. As old urban neighbourhoods are demolished to make room for new development, people are forced to move. This leads to the break-up of social structures, where people whom after spending their lives in a decidedly local urban neighbourhoods, find themselves resettled to remote suburban areas.

The urban expansion and industrialization create similar situations in rural areas, when villages are absorbed by the city. Large areas of farmland have been expropriated, and the farmers’ lack of education makes it difficult for them both to handle relocation negotiations and to find other employment. Suddenly, they find themselves living in a rural village, not surrounded by farmland from which they can sustain themselves, but by skyscrapers that they cannot access.

New York Times April 13, 2006
Culturally, many valuable historic heritage sites and old houses have been demolished, because their owners cannot protect them from bulldozers.

China Daily Online September 30, 2003

China has more than 400,000 fixed unmoveable historical sites, and has 30 cultural and natural monuments listed on UNESCO’s World Heritage List. In an era of modernization, cultural heritage conservation is difficult in spite of government awareness. Historical sites become encapsulated by the expanding cities. Excavation and protection of heritage is costly, and sometimes has to be weighed against financial gains from new development.

Gansu Daily, July 5, 2005
New York Times, April 13, 2006
People’s Daily Online, September 30, 2003