Guangzhou Low Carbon Society 2030

A win-win strategy for global climate change and sustainable development of regional economy

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Content

- The importance & motivation of building Guangzhou into a low carbon society
- Current energy status and CO_2 emissions of Guangzhou
- Guangzhou's initiatives towards a low carbon society
- Research objectives & contents
- Guangzhou Low Carbon Society 2030-narrative
- Research Status& Future work

Content

- **The importance & motivation of building Guangzhou into a low carbon society**
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Importance & Motivation

- **Global warming and other environmental issues have posed severe threats to the ecosystem and human's survival..**

Importance & Motivation

- **Chinese President Hu Jintao expounded China‘s stance on tackling climate change and other issues at the 15th Economic Leaders’ Meeting of the Asia-Pacific Economic Cooperation (APEC) forum on 8th September, 2007.**
- **At the UN Climate Change Summit, President Hu stated that China “will endeavor to increase the share of non-fossil fuels in primary energy consumption to around 15% by 2020”.**

Importance & Motivation -Why Guangzhou?

1. Location

Guangzhou (known as “Canton” & “Kwangchow”)- is the capital of Guangdong province in the southern part of China. It is a port on the Pearl River, navigable to the South China Sea, and is located about 120km (75miles) northwest of Hong Kong

Importance & Motivation -Why Guangzhou?

Administrative divisions

It has direct jurisdiction over 10 districts,

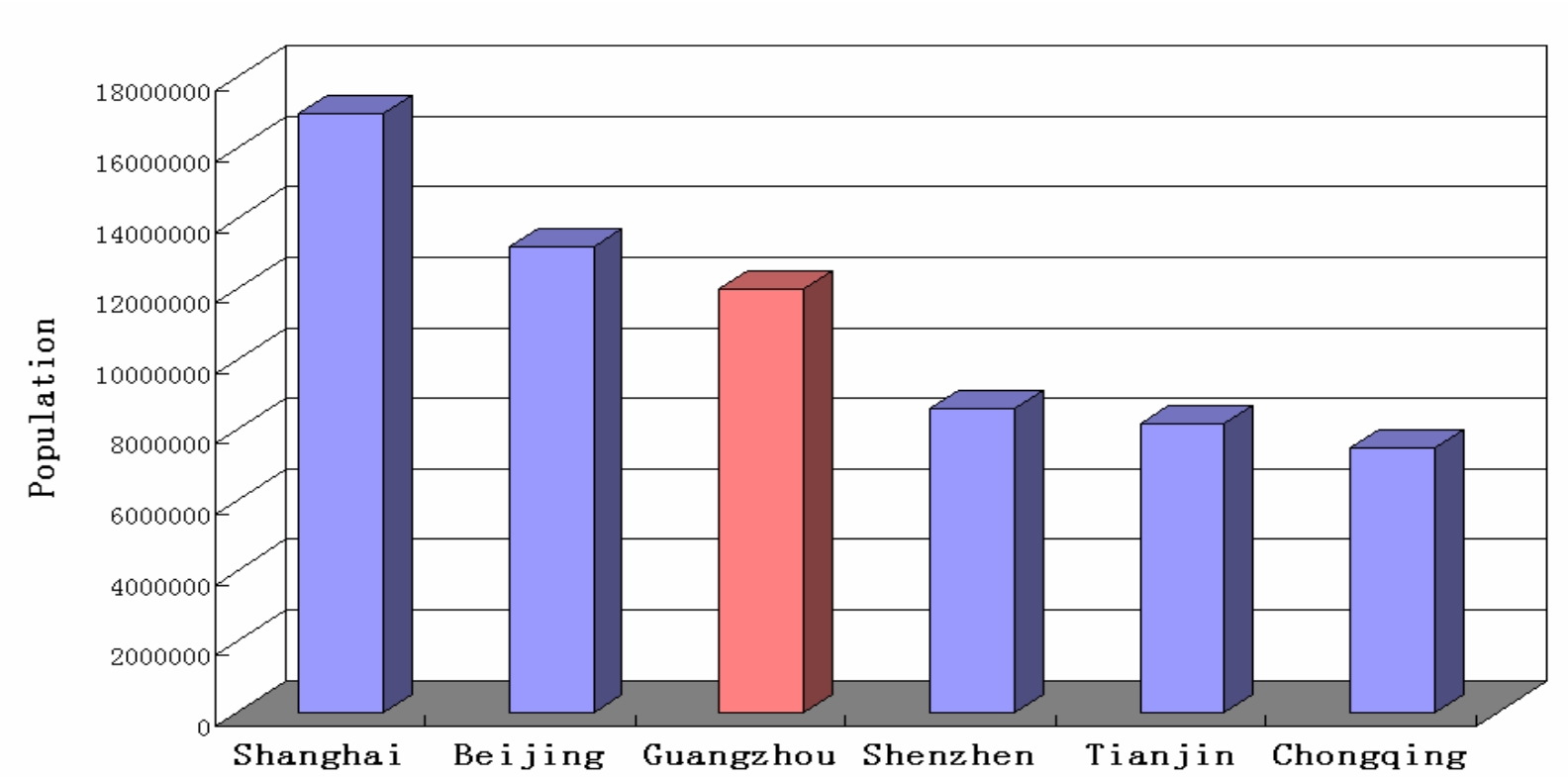
2 county-level cities

Guangzhou's urban land area is the third largest in China, behind only Beijing and Shanghai.

Importance & Motivation -Why Guangzhou?

2. Population

(2000 census), the city has an urban area population of roughly 11.85 million. It is the most populous city in Guangdong province, and the third most populous metropolitan area in China



source:"List of cities in the People's Republic of China by population". From Wikipedia

Importance & Motivation -Why Guangzhou?

3. Economy

Guangzhou is the main manufacturing hub of the Pearl River Delta, one of mainland China's leading commercial and manufacturing regions. In 2008, the GDP reached ¥821.58 billion (US $118 billion), per capita was ¥81,233 (US $11,696), ranking 7th among the other 659 Chinese cities.

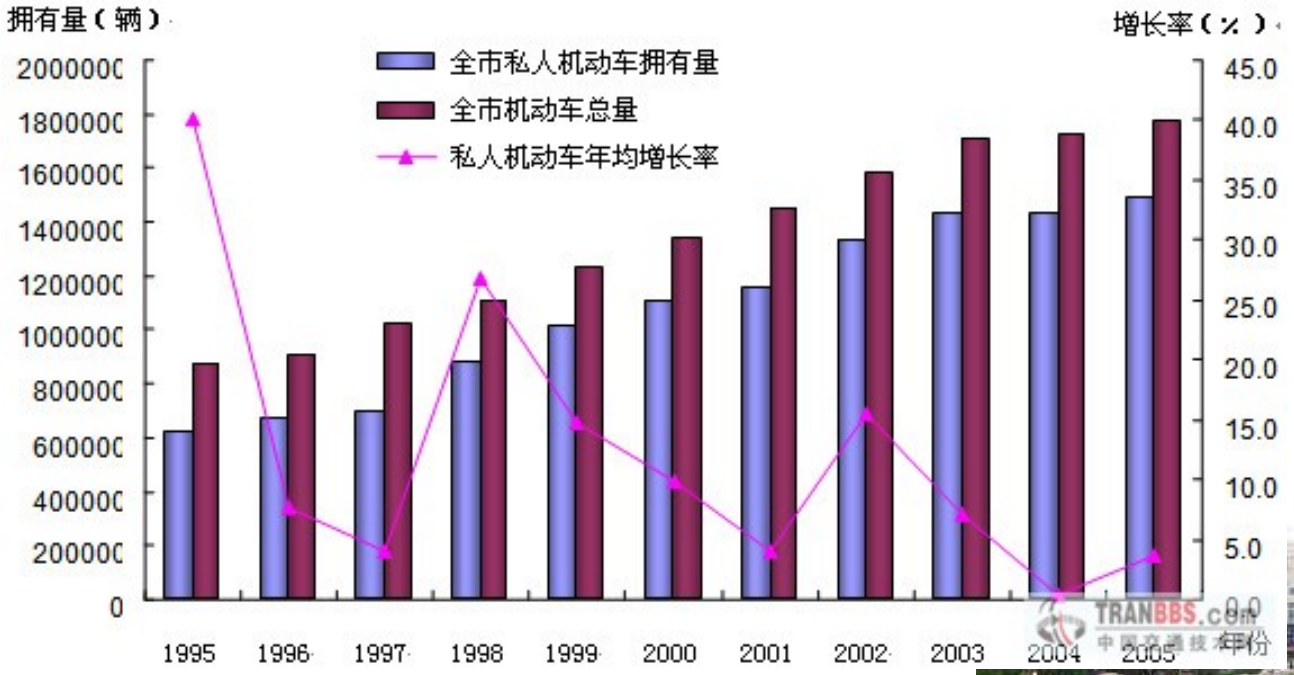
GDP per capita in 2008

Rank	City	Province	GDP per capita
1	Hong Kong	Hong Kong	US$43800
2	Macau	Macau	US$36357
6	Shenzhen	Guangdong	￥89814
7	Guangzhou	Guangdong	￥81233

source:" List of cities in the People's Republic of China by GDP per capita ". From Wikipedia

Importance & Motivation -Why Guangzhou?

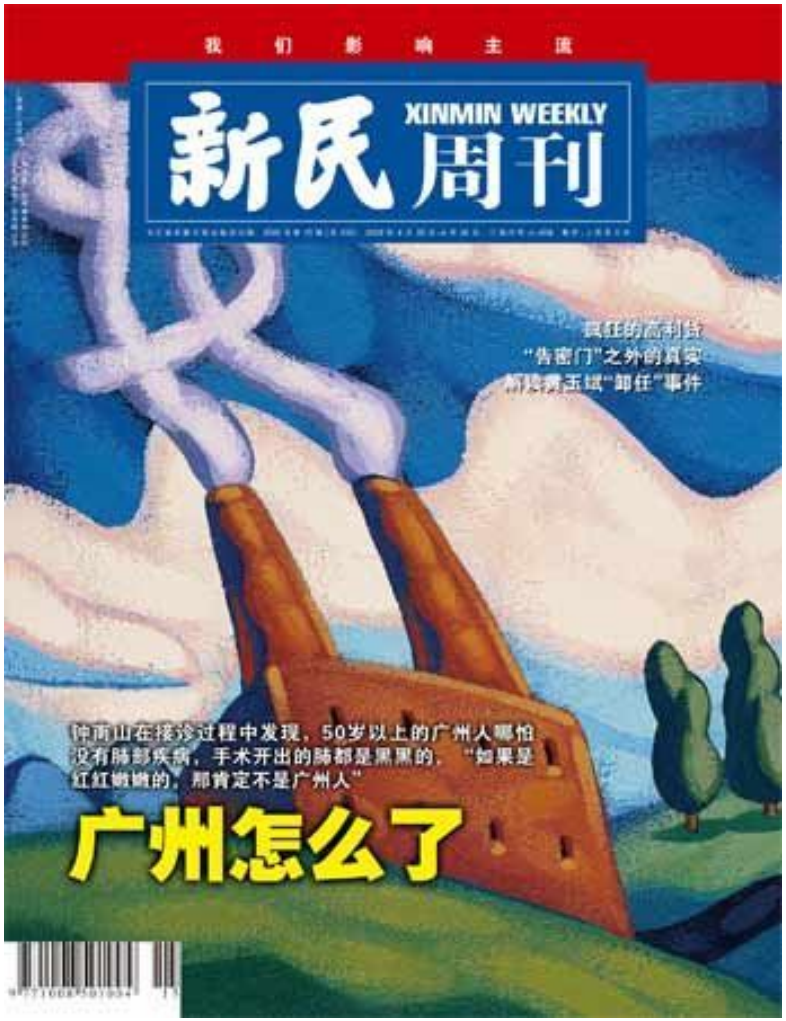
4. Environment



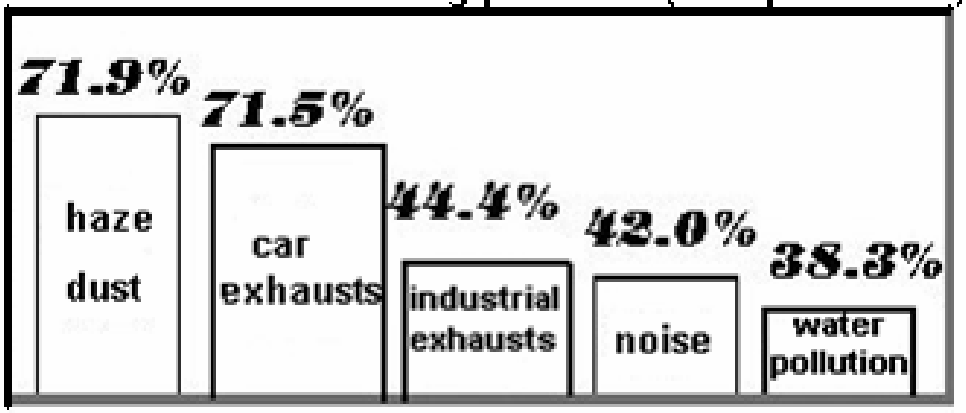
Emissions from motor vehicles have become one of the major sources of pollution in Guangzhou

Importance & Motivation -Why Guangzhou?

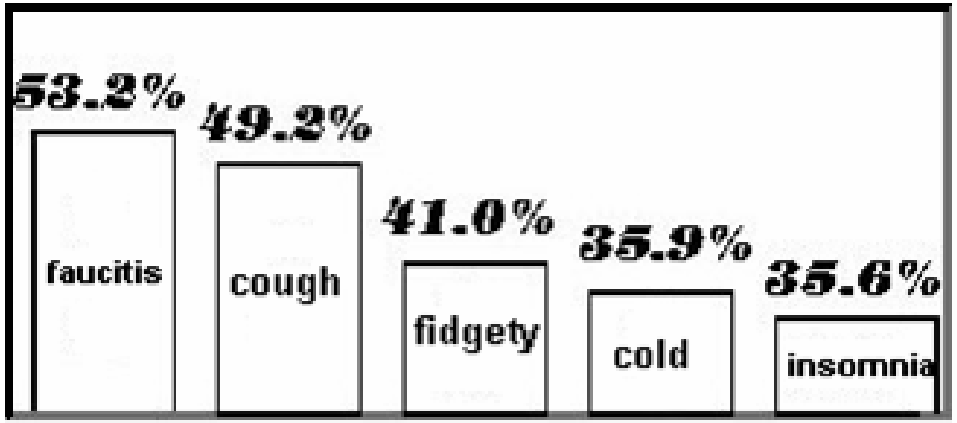
4. Environment



Respondents considered physical discomfort is related to the following pollutants(multiple choice)



Because of pollution, physical discomfort symptoms(multiple choice)



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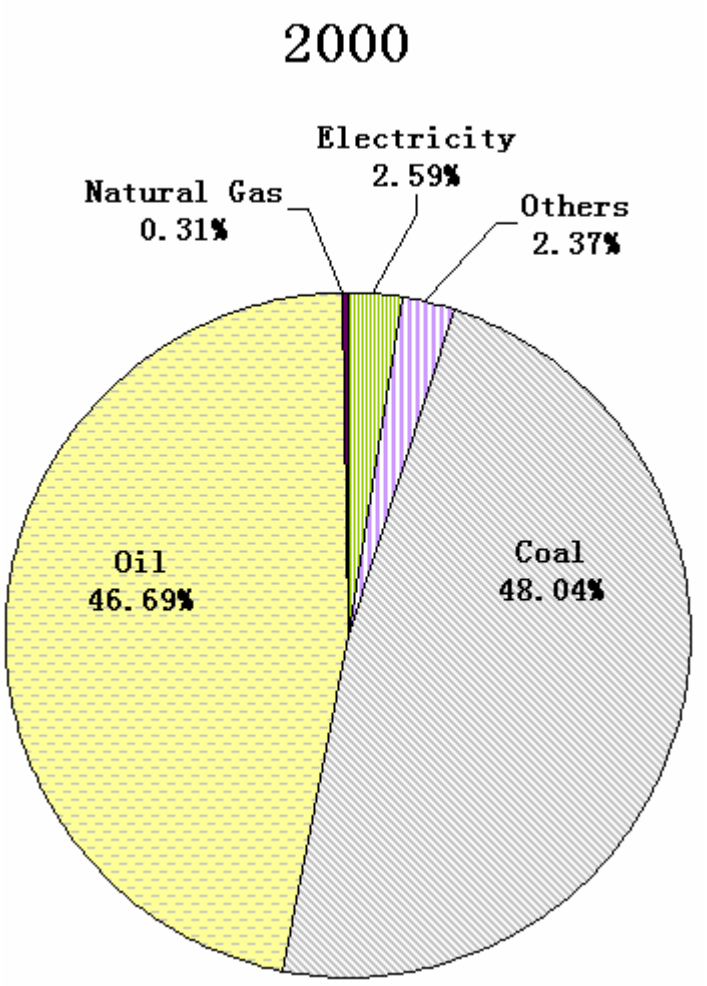
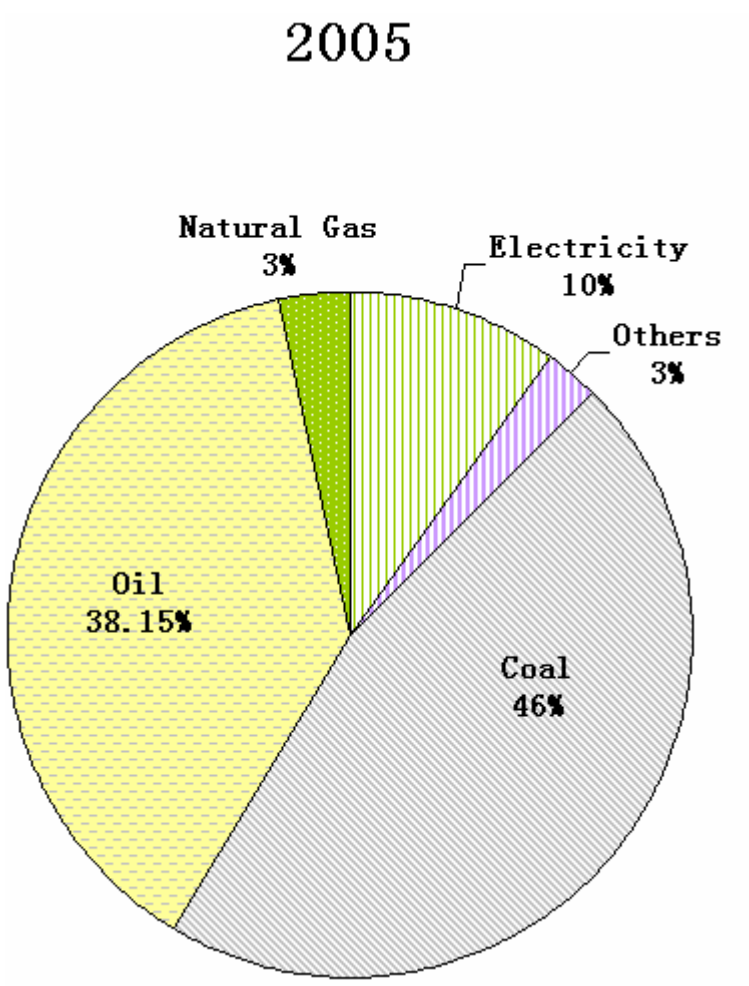
Energy Status & CO_2 emissions

Primary Energy Consumption Structure

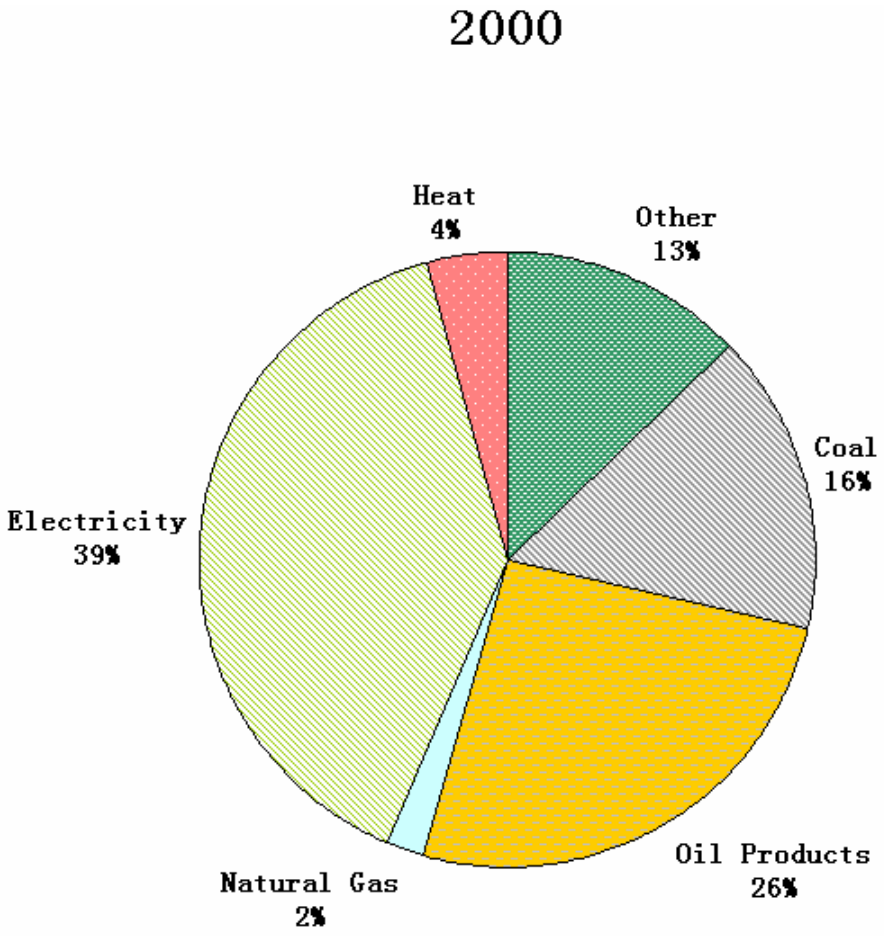


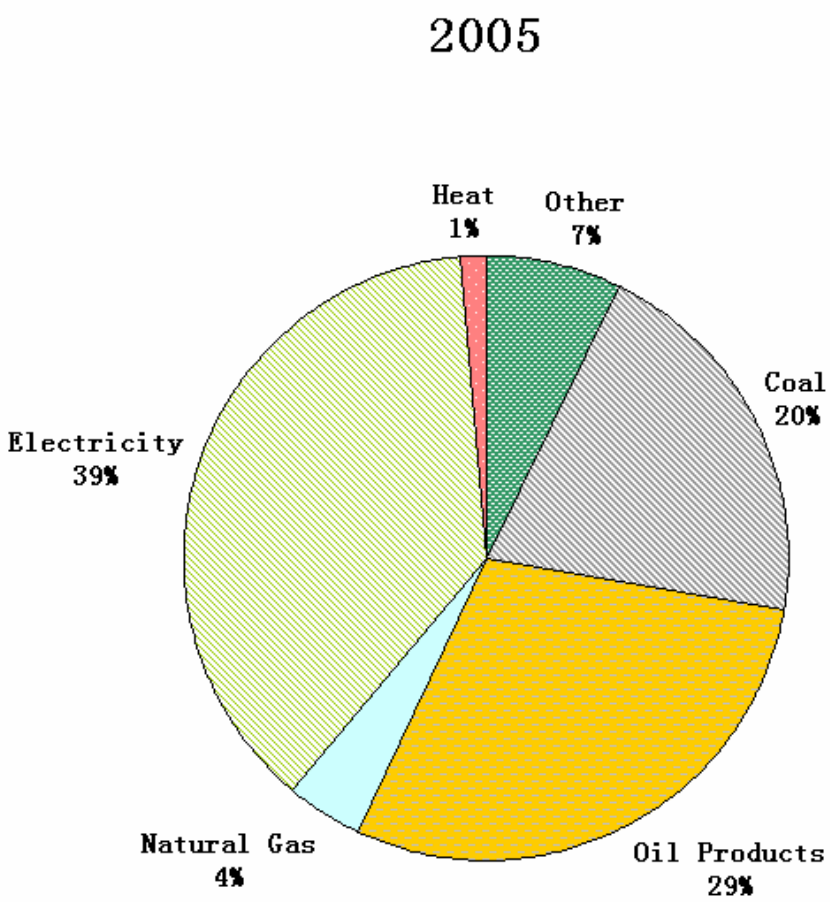


Source: <<Eleventh Five-Year Energy Plan-Guangzhou>>-- Guangzhou Government

Energy Status & CO_2 emissions

End Use Energy Consumption Structure

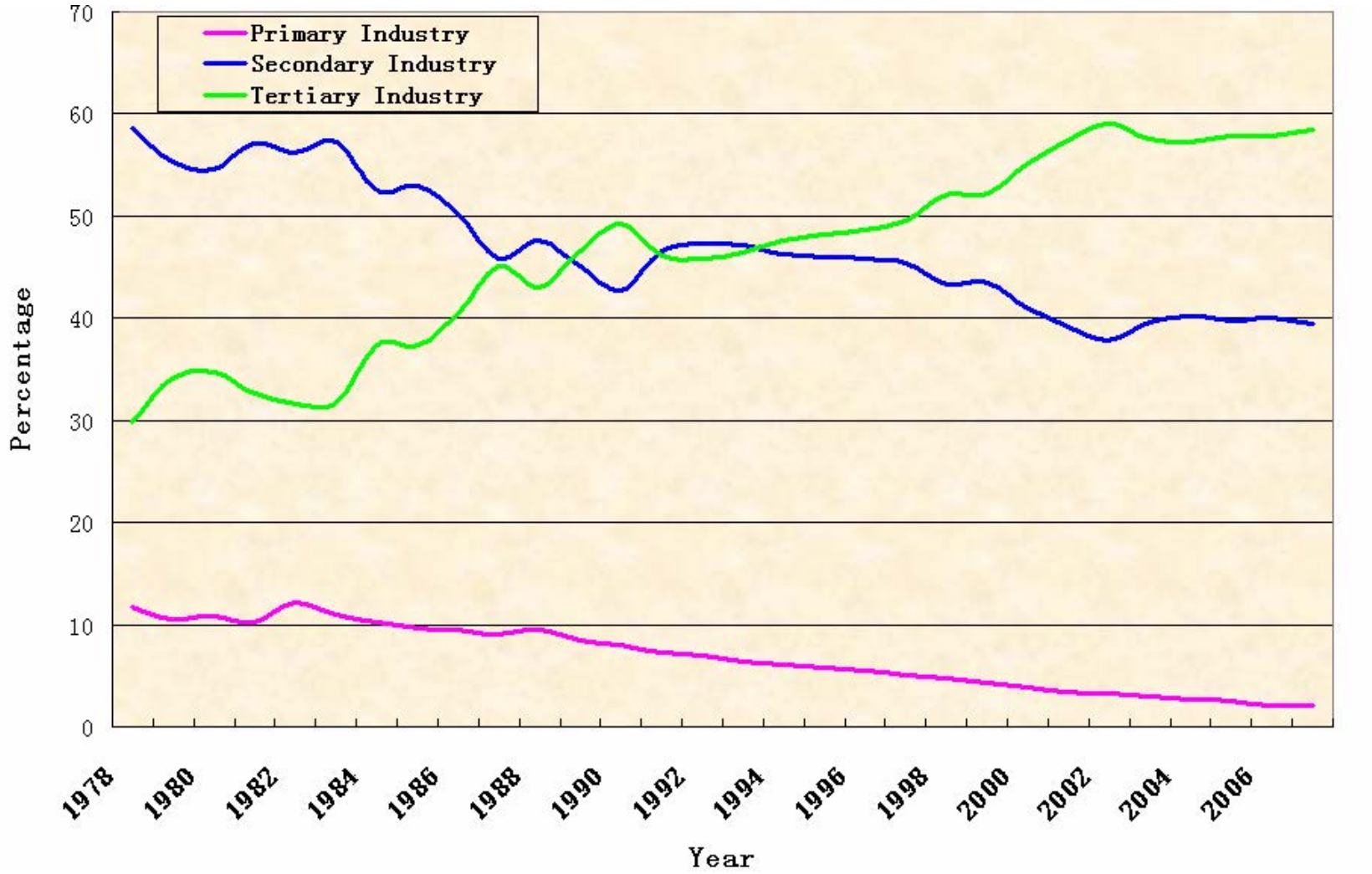




Source: <<Eleventh Five-Year Energy Plan-Guangzhou>>-- Guangzhou Government

Energy Status & CO_2 emissions

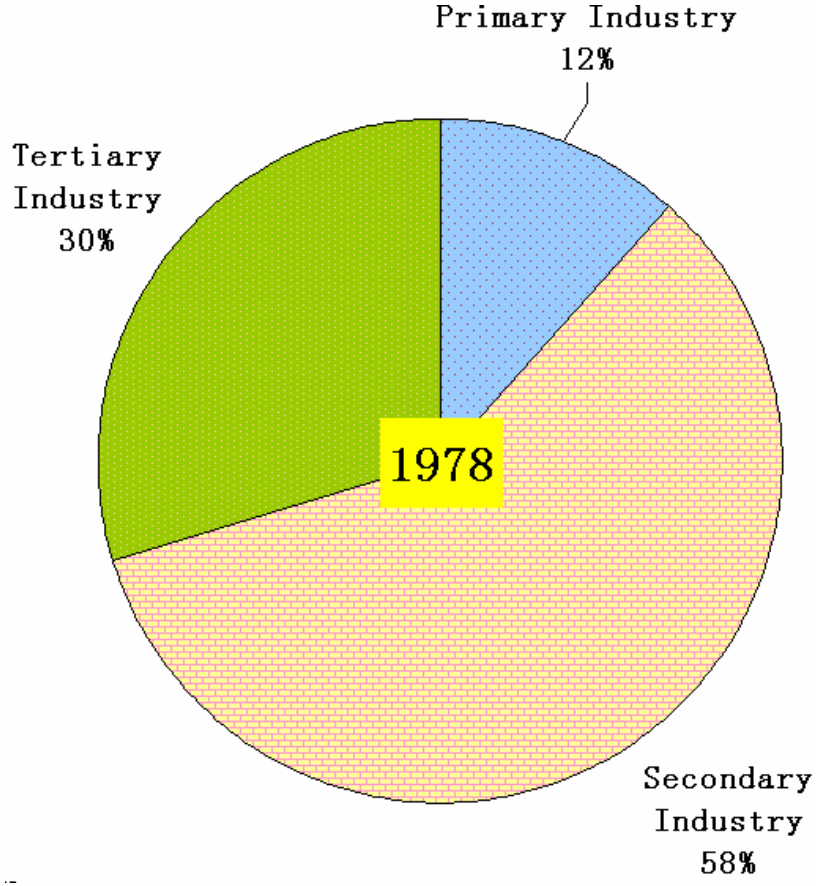
GDP Share

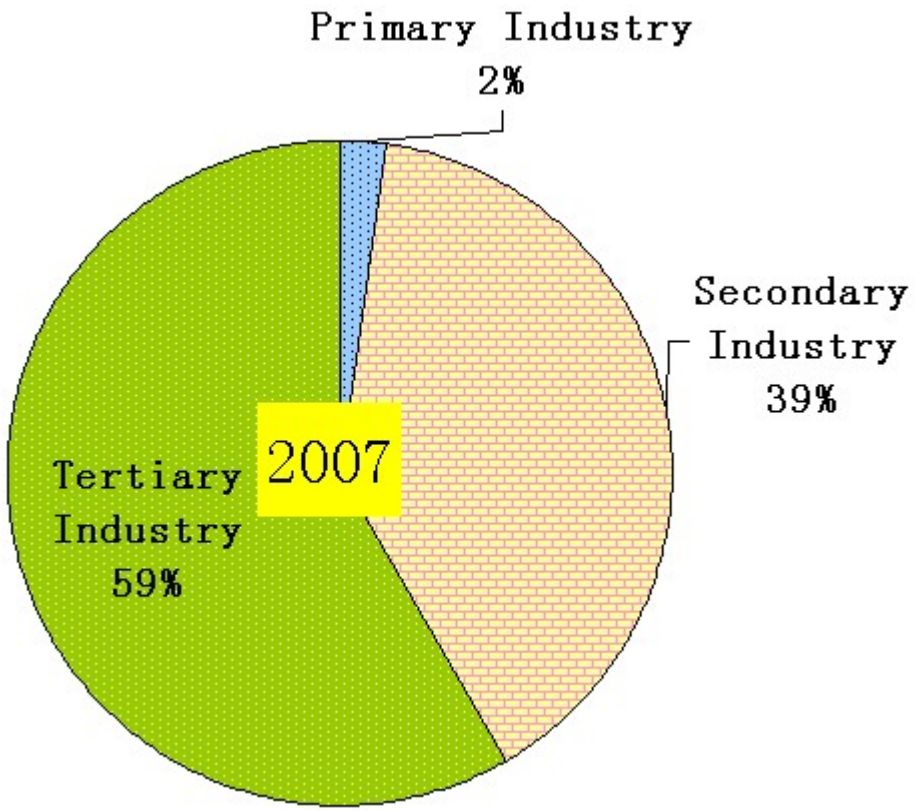


Source: Statistics Bureau of Guangzhou Municipality

Energy Status & CO_2 emissions

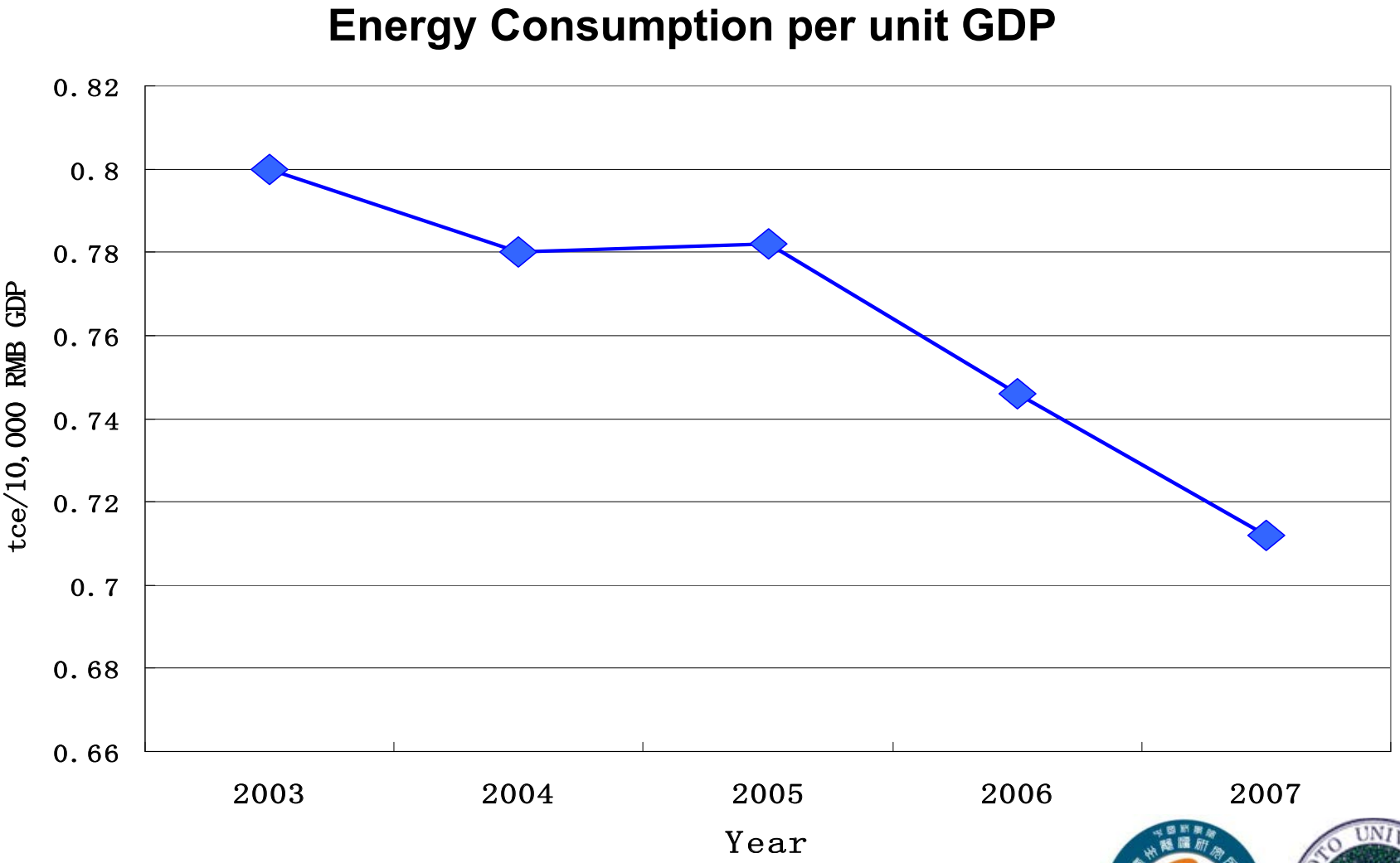
Comparison of GDP Share





Source: Statistics Bureau of Guangzhou Municipality

Energy Status & CO_2 emissions

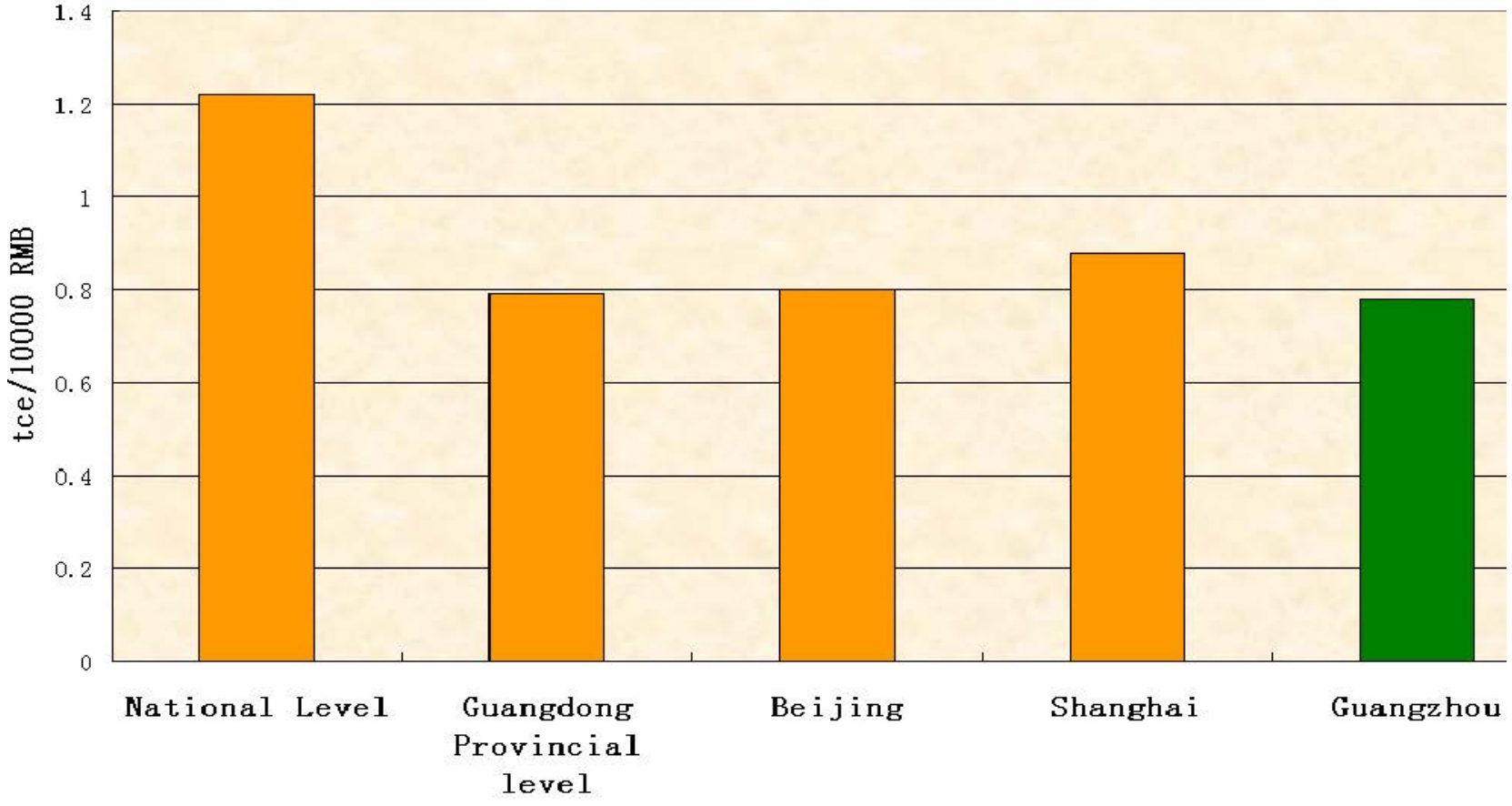


Source: Statistics Bureau of Guangzhou Municipality

Energy Status & CO_2 emissions

Energy Consumption per unit of GDP

(2005)



Source: <<Eleventh Five-Year Energy Plan-Guangzhou>>-- Guangzhou Government

Energy Status & CO_2 emissions

Energy Consumption of Guangzhou- 2005

item	unit	2005	2010(estimated)	annual average growth rate %
Coal	10000tons	2591.4	3500	6.2
Petroleum products	10000tons	1370	1800	5.6
Gas	10000tons	101.6	210	15.7
Electricity	0.1 billion kwh	425.67	710	11
Total energy consumption	10000tce	4029.3	5900	8
Annual energy consumption per capita	tce	5.4	7.3	6.2
Annual elctricity consumption per capita	kwh	5721	8852	9.1
Annual natual gas consumption per capita	kg	132	260	14.5
Energy Consumption per unit of GDP tce/10000RMB	tce	0.78	0.62	-4.4

Source: <<Eleventh Five-Year Energy Plan-Guangzhou>>-- Guangzhou Government

Energy Status & CO_2 emissions

Energy Consumption per capita - 2007

Guangzhou	4.5 tce
National	2.38 tce

Source: Guangzhou Government. http://www.gz.gov.cn/vfs/content/newcontent.jsp?contentId=698423&catId=4109

Energy Status & CO_2 emissions

CO_2 Emissions of Guangzhou-2005

(rough calculation)

	CO2 Emissions (million tons of CO_2)	CO2 Emissions (million tons of Carbon)
TOTAL	**112.38**	**30.62**

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Initiatives towards a low carbon society

1. Comfortable and green environment

2003-2008:Promoted "blue-sky" projects and "clear water" projects-first phase. Spent 40 billion RMB, and completed Green Land of 131 km^2, rural forest zone, etc. In 2008, Guangzhou's forest green rate reached 44.4%, forest coverage rate reached 38.2%, public green area of 13.01 m^2 per capita. by 2015, the overall eco-system environment in Guangzhou is to reach first-class in the nation, the first step to a garden-like city.

Initiatives towards a low carbon society

2. Energy Saving& Emissions Reducing, Optimization of Industry Structure

2005: Guangzhou municipal government set the "eleven-five year's plan" targeted at realizing energy saving of 20% during 2006-2010. Annual energy saving rate of 4%.

2008: Guangzhou municipal government commenced monitoring more than 100 enterprises (their annual overall energy consumption is more than 10000 tce), and signed the "eleventh five-year" letters of responsibility for energy-saving targets with 113 key enterprises.

2009:Guangzhou municipal government set counter measures on adjusting the industry structure and started to make development plans for industries, aiming to achieve an energy-saving structure.

Initiatives towards a low carbon society

3. Utilization of new and renewable energy

2009: Guangzhou municipal government information office held the press conference on "New and Renewable Energy Development Plan(2008-2020) of Guangzhou" . It is stated that the city's overall goal is to gradually increase the proportion of new and renewable energy in the energy structure. By 2020, new and renewable energy will share 15% of the total energy consumption of Guangzhou.

10 key demonstration projects will be completed by 2020.

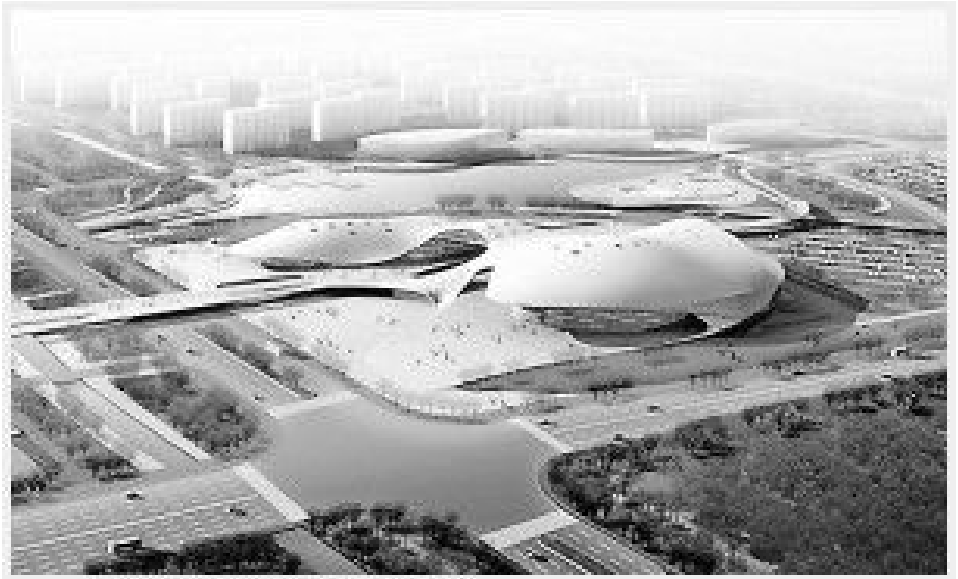
1. Rural area new energy project
2. Municipal solid waste treatment project
3. Green electricity project
4. New energy technology R&D
5. Green public transportation project …….

……..etc.

Initiatives towards a low carbon society

4. Low carbon Buildings

2009 : Guangzhou City Municipal Party Committee General Office issued the "Action Directive on Building Guangzhou into a Garden-Like City (2009–2015)". By 2010, Guangzhou is to be built into a harmonious and beautiful "Green Asian Games City" “Asian Game City” will greatly utilize renewable energy and the total energy saving rate of the green buildings of Asian game city will be 50%.



广州亚运会场馆效果图。

Initiatives towards a low carbon society

5. Low Carbon Zone

2010 : (January) at the eighth plenary session of the ninth CPC Guangzhou Municipal Committee, it was announced that Guangzhou will strive to build a low-carbon city. “Guangzhou will give high priority to the research and development of low-carbon technologies and the accumulation of such technologies, endeavor to grow the low-carbon economy, promote low-carbon lifestyles and eco-friendly consumption of materials, and step up the efforts to build an industrial system and consumption model that will ensure low carbon emissions”.

Initiatives towards a low carbon society

6. Recommendations from experts through forums

2009： a Low Carbon Economy Forum of Guangdong, which was supported by GIEC and WWF, was held in Guangzhou. Nearly 300 experts from home and abroad attended this forum. Important recommendations were made in many fields, such as industrial development, urban construction, transportation, and so on, to promote the low carbon economy development of Pearl River Delta Region.

Initiatives towards a low carbon society

7. Low carbon transportation

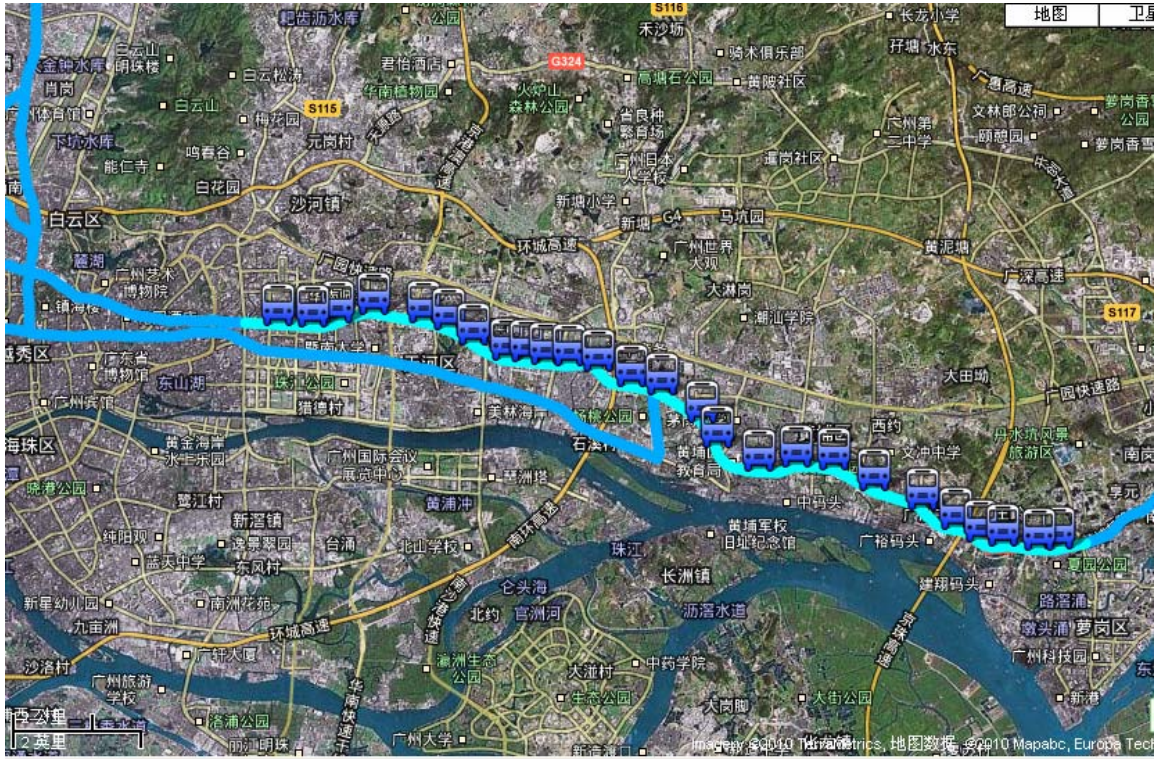
- **6759 buses and 16700 taxis use LPG.**
- **Waterway transportation energy consumption per unit reduced from 5.17 tce/10000 tons of throughput (in 2000) to 3.51 tce/10000 tons of throughput (in 2007): reduction rate: 32.1%.**
- **Optimization of transportation organization management.**
- **Implementation of the transformation of the facilities at transportation stations (energy saving lamp bulbs, using natural lights, air conditioner etc.**

•The nation's first "eco-station"- Haizhu Terminal was built (vehicle exhaust collection and treatment systems, clean air purification system, sewage treatment and recycling system, natural ventilation, solar water heater etc).

Initiatives towards a low carbon society

7. Low carbon transportation

- **BRT (Bus Rapid Transit)**



首个实现BRT站台和地铁站直接物理连接的BRT系统；
世界上最长的BRT站台；
按照设计规范，BRT站台拥有世界上最大的上客量，某些站点每小时将有超过4000人乘车。

Initiatives towards a low carbon society

8. Low carbon lifestyle & Public awareness

2008 and 2009：Guangzhou took part in World Car-free Day by advocating private car owners not to drive, and to limit the usage of the governmental cars. Citizens could rent a bike in a day for free .

Initiatives towards a low carbon society

8. Low carbon life style & Public awareness

Hundreds of University students participated in the environmental protection activities in order to convey to young people the importance of energy-saving and environmental protection. Their slogan is “Low Carbon Today, Green World Tomorrow”

Initiatives towards a low carbon society

8. Low carbon life style & Public awareness

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Low carbon scenario research

Cooperation between：

Guangzhou Institute of Energy Conversion, CAS &Kyoto University

Started:mid December 2009

Framework:

Title：Guangzhou Low Carbon Society Scenario 2030

Targeted area：Guangzhou

Base year：2005

Targeted year：2030

Target gas: CO_2 emissions from fossil fuel combustions

Low Carbon Target: ???

Tools: ExSS Tool & BCT

Low Carbon Research

Objectives：

First phase (by mid 2010):

to complete a report (booklet) on the quantitative analysis of low carbon scenarios by 2030 of Guangzhou and to obtain further enhanced support from the city government in order to carry out more detailed and comprehensive research work.

Second phase: establishment of roadmap to LCS 2030, cost-effect analysis，ensure the policy innovation， makes the research findings to contribute to the transition of Guangzhou towards a low-carbon society.

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Low Carbon Scenario-2030

Low carbon scenario-2030 (narrative)：

1. **Transportation：** undergrounds railways, BRT are the main measures to solve Guangzhou's transportation issues, compact-city planning, transportation demand planning, electric cars, new energy vehicles（new energy bus & taxi are largely integrated into the city public transportation system, new energy powered vehicles are largely used as private cars.) will largely been utilized.

2. **Industry：** Guangzhou has been chosen as one of the "National five central cities". The function of Guangzhou will change dramatically in the future. Retail and service, finances, logistics will share a large proportion in the structure. optimized industry structure.

3. **Energy：**low carbon electricity，enhance the utilization of renewable energy （by 2020，renewable energy will share 15% of the total energy consumption, 6.6 million tce/ year. SO_2 recution: 180,000 tons. CO_2 reduction: 20 million tons) Nuclear power, smart grid… 2030：？

4. **Lifestyle：**Energy saving buildings (by 2020, 40% or more new buildings will implement renewable energy technologies）、green-life style、construction of carbon sink system。

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Research Status& Future Work

Completed:

Collection and processing of base-year data

Future work:

Calibration for the base year

Determine low carbon targets and measures (simultaneously, constantly and frequently communicate with government and industries, to integrate Guangzhou's socio-economy development into our study.)

Setting future socio-economic assumptions and BaU case estimation

Estimation of snapshots with LC measures.

Complete a summary report (by June 2010) which has great positive influence and is crucial to the Guangzhou's LCS development.

THANKS FOR YOUR ATTENTION!