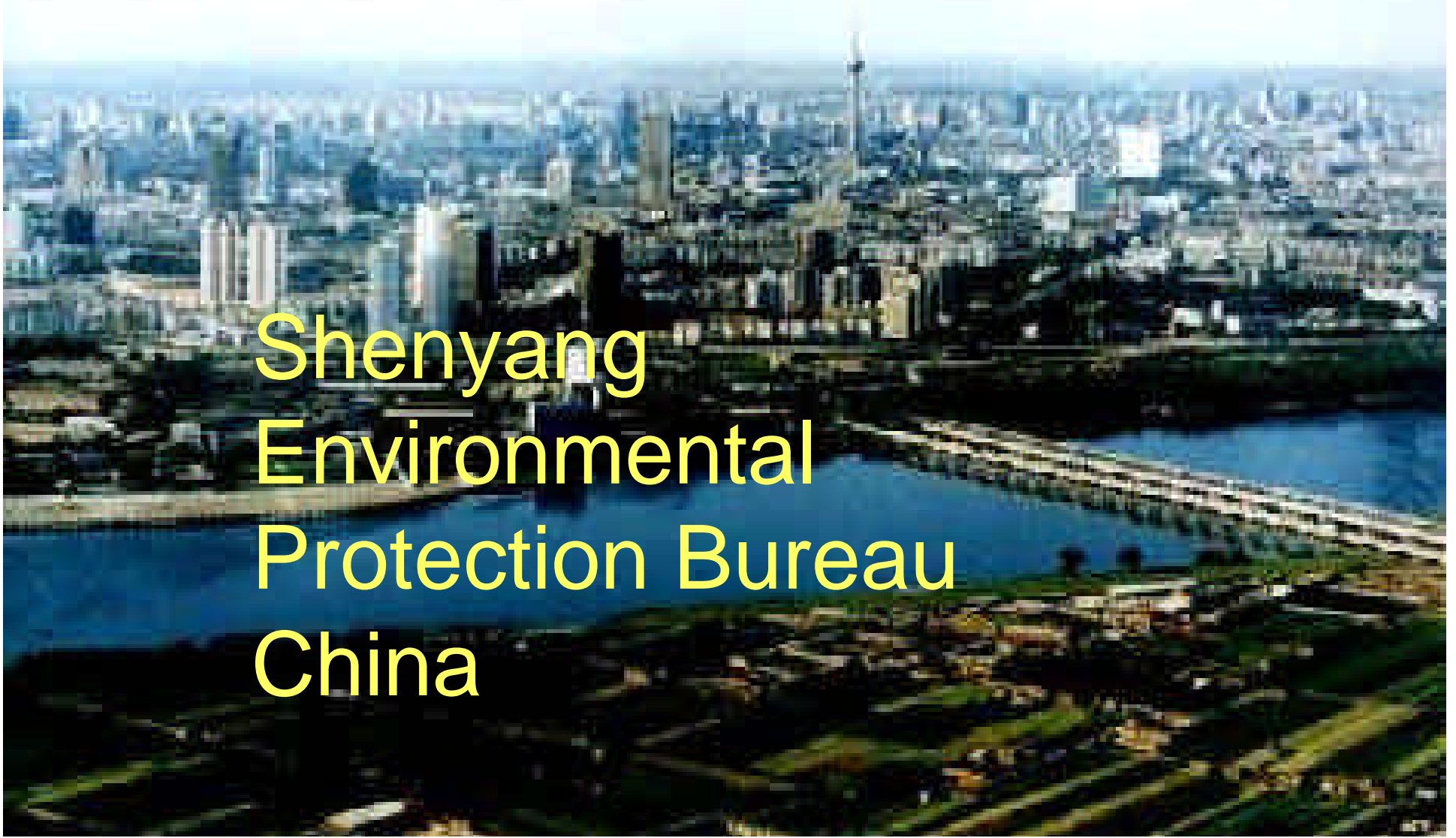
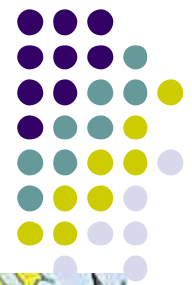


Improving Shenyang's Air Quality Preventing Global Warming

Shenyang
Environmental
Protection Bureau
China

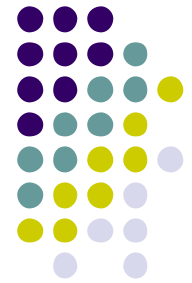




Shenyang City

- the capital city of Liaoning Province
- the central city in the Northeast China
- area of 12,980 km²
- population of 7,200,000
- typical heavy industry city



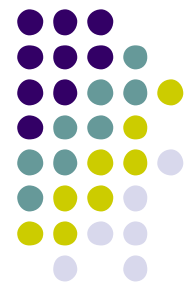


Improving air environment

in the past

- the air environment was polluted seriously
- it was hard to see the blue sky 8 years ago
- traditional industries with high consumption of energy, raw material





Improving air environment

Recent year

- Thanks to the local efforts and assistances from outside
- the visitor and Shenyang's resident share the same comments that the sky is clear and air is fresh
- the numbers of Good air quality days were increasing from 162 days in 2001 to 301 days in 2004, and will be striving up to 315 days in 2005





Air Pollution Control benefit locally and globally

Locally

- solve air pollution
- improve energy utilization efficiency
- reducing energy consumption

Globally

- Reduce greenhouse gas discharge
- contributed to prevent Global warming



Air Environment improvement and Economic Development



- GDP rising 10.1%, 13.1% and 14.2% from the corresponding period per year from 2001 to 2003
- released from vicious circle of economic restricted environment and environment deter economy.
- GDP energy consumption has maintained lower than the average level in China by 28%.



Major initiatives

- adjust industrial structure
- Reduce proportion of high-energy consumption industry
- stop using outdated technologies
- Restrict permission for high-energy consumption industry
- popularize central heating
- Cleaner energy technology

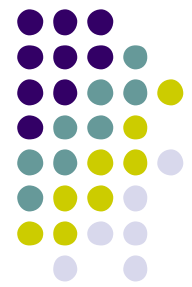


The basic characteristic of Shenyang's air pollution

main Air pollutant rooted
in burning fuel

- 70% of energy from coal burning
- coal burning dust pollution is the major reason in heating season





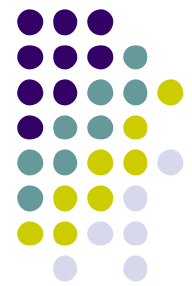
Major Problems of Air Pollution

low energy thermal efficiency

- boiler cover average rate is 60% in Shenyang
- single stove thermal efficiency and civil small stove efficiency respectively 30% and 15%
- large CO₂ emission of pollutants which caused serious pollution

motor vehicles increasing pollution

- Motor vehicles increasing by 15%
- pollution from exhaust getting worse
- bring a great deal CO₂ and hydrocarbon.



Adjust industrial structure to reduce energy consumption and pollutant discharge

In the past

Shenyang's pillar industry was metallurgy and chemical , 70% of the total industry

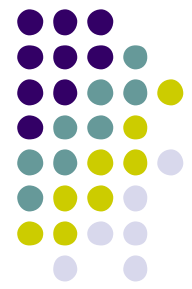
recent years, Adjust industrial structure to reduce energy consumption and pollutant discharge

- many heavy industries with serious pollution to be retreated from Shenyang urban such as steel, metallurgy and construction material.
- 500 factories, with out of date equipment, serious pollution, high-energy consumption and low efficiency were stopped and move
- since 1995, therefore work up 3 categories industries of vehicle and its spare parts, machinery and electronics information
- formed eight leading industries: medical treatment machinery, etc.



Enhance centralized heating system to improve thermal efficiency

- It is necessary to force some small stokehold and boilers to stop operation and to connect some scattered boilers into central heating network
- According to heating areas and development potential, it is estimated there will be 300 stokehold in our city
- stopped an amount of 3000 chimneys, 900 stokeholds
- increase centralized heating area 98,000 km²
- heating efficiency increase to 70% from 50% since 2000.



Develop and optimize centralized heating facilities

- Based on Thermal power priority, develop big scale Thermal Power Plants
- to build, rebuild, and extend some large heating source factories.
- Improved policies of building heating sources
- broadly open heating market
- toward development of market orient industrialization, specialization
- and the government supports proper subsidy
- Established 21 project on developing heating source



Enhance auditing of boilers management

Make technique policies of development projects with environmental management

- in urban area, it is no longer approved to build temporary stokehold with single boilers below 40 T/h or the total capacities below 80 T/h
- upgrading project should be over 20 T/h





Enhance auditing of boilers management

- it is required to use clean energy such as oil, electricity and gas
- adopt clean burning technique, such as water-coal slurry.
- Within two years, over 10 heating projects to be rule against
- rebuild 18 of centralized heating sources.



Apply high energy efficiency techniques in energy consumption

- undeveloped equipment was banned
- popularize energy-saving burning technology of supply coal by different layer for 900 set of units and saving coal 10%
- continuous heating at low temperature
- coal-water slurry and energy saving civil boilers.
- Energy-saving coal brake
- Agencies of burning improvement



Adjust energy structure to improve energy efficiency

- utilizing and introducing coal gas and natural gas
- There are 26 coal burning groups to use natural gas
- a total amount of gas production is over 23,000 cubic meters.

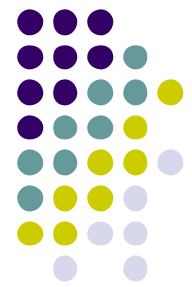




Utilize renewable energy to reduce coal use

in the school, resident areas and hospital.

- popularize water-source heat pump
- land heat
- energy saving construction material
- For three years, reduce coal-burning 600,000 tons through the use of clean heating technique and energy saving material.
- energy-saving buildings 200 million M2



Implement CP to popularize energy saving and cost reducing

- 280 big scale enterprises has been popularized of CP, 60% of total amount,
- coal-saving is over 200,000 tons





Implement pollution control of vehicle exhaust

- Altogether 8,000 vehicles with problems were treated with limited time
- 40,000 motor vehicles were selectively inspected per year
- Provide 2000 new public buses
- Buses with 95% stipulated standards.

