

# Urban & Rural Water Pollution: Hazard & Contro

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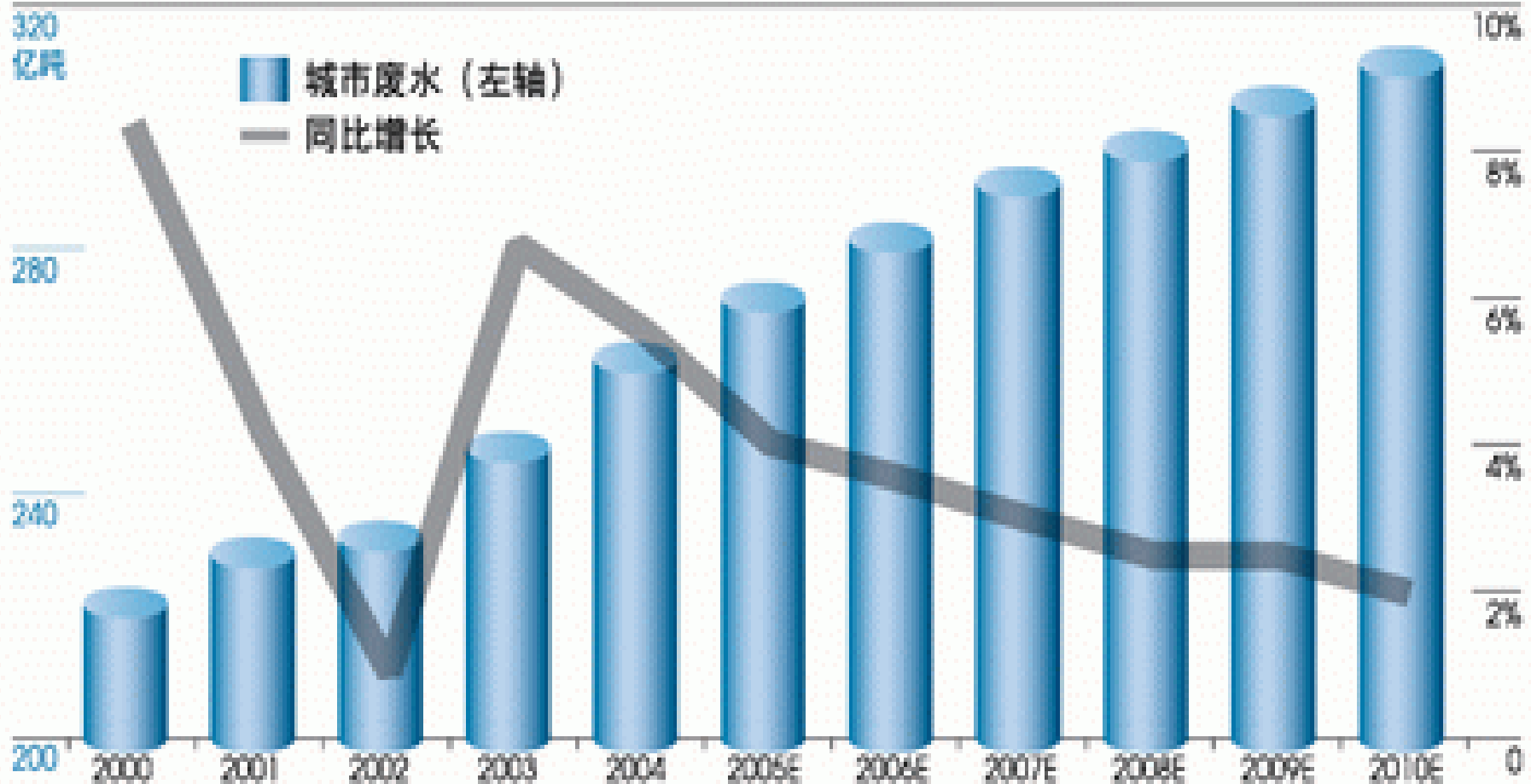
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28 August, 2007

Erdos, Inner Mongolia

# Urban waste water discharge grows in volume year by year.

图1:中国城市污水排放量及增长率



数据来源: 申银万国证券研究所

## Urban & Rural Wastewater Treatment: A Large Gap to Fill

- By the end of 2005:
- China still has 278 cities without a wastewater treatment plant. (Among them, 8 cities have a population of over 500 thousand.)
- 5000 Organic towns do not have a wastewater treatment plant.
- 20000 market towns do not have a wastewater treatment plant.
- Over half of China's population has their domestic sewage untreated.

# Urban wastewater discharging direct into river






There's distinctive difference between cities in regard to wastewater treatment capacity.

- In 2004, Shanghai discharged 2.054 billion cbm of wastewater.
- Including 1.363 billion cbm of grey water, which is 2/3 of the total.
- And 691 million cbm of industrial wastewater, which is 1/3 of the total.
- 65.3% of all wastewater in Shanghai is treated.
- Guizhou Province has 1.2 million tons of daily wastewater discharge. There are 2 wastewater treatment plant in operation, with a total treating capacity of 10 tons a day. The treatment rate is 8%.

## Wastewater Treatment Capacity is to Double in the Next 5 Years

- China's National Plan:
- In 2010, national average wastewater treating rate is to be over 50%; Wastewater treating rate in large cities shall be over 60%; Wastewater treating rate in extra large cities and tourist cities shall be over 70%. 1000 new wastewater plants are to be built up.
- Wastewater fee has been raised many times. This encourages wastewater treating enterprises.
- Piping networks are not complete. This makes most of the treatment plants running under capacity.

A photograph of a large, industrial pig farming facility. The facility is a long, narrow hall with rows of concrete pens on both sides. A person in a blue uniform is walking down the central aisle. The ceiling is high with a complex metal truss structure. The walls are light-colored and have a series of windows along the top. The floor is dark and appears to be made of concrete or a similar material. The overall atmosphere is clean but industrial.

Aquaculture and livestock farming industry in rural areas have serious problems of wastewater.

- China is the largest country for pig husbandry, with 470 million live pigs in stock. (The world's stock of live pigs is 950 million.) China's annual rate of butchered pigs is 122%. China is the largest pork producing country.
- China is also the largest husbandry country for goats, chickens, ducks, and sweet water fish, etc.

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# Pig Farms Distribution in China

年出栏50-99头占总出栏的比重



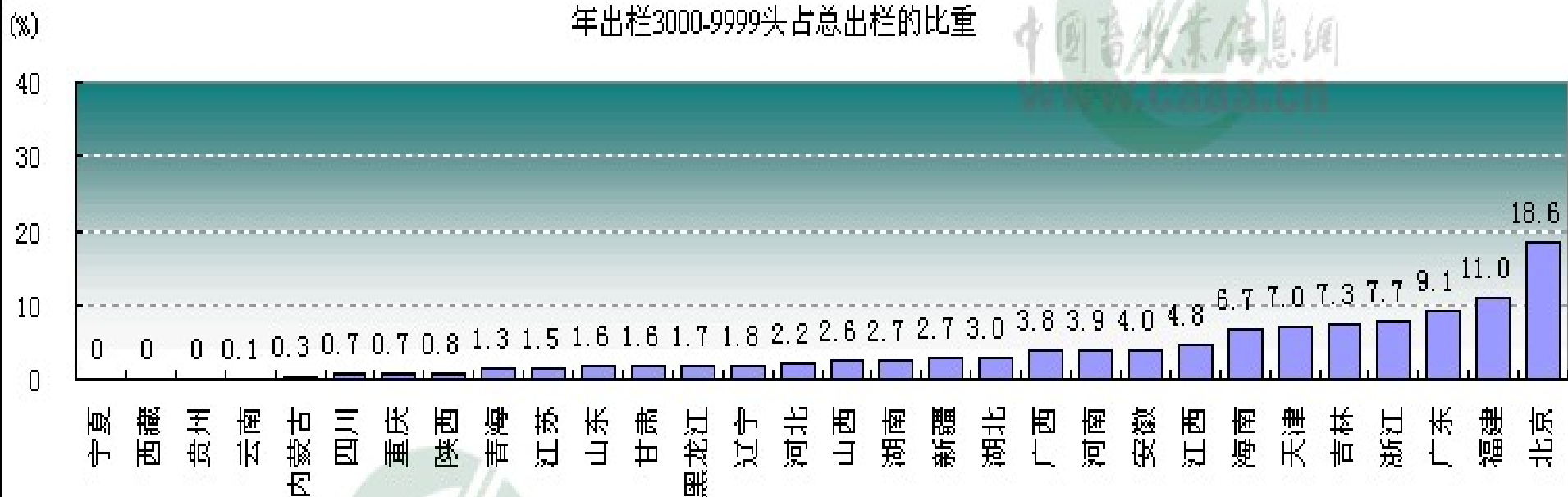
年出栏100-499头占总出栏的比重



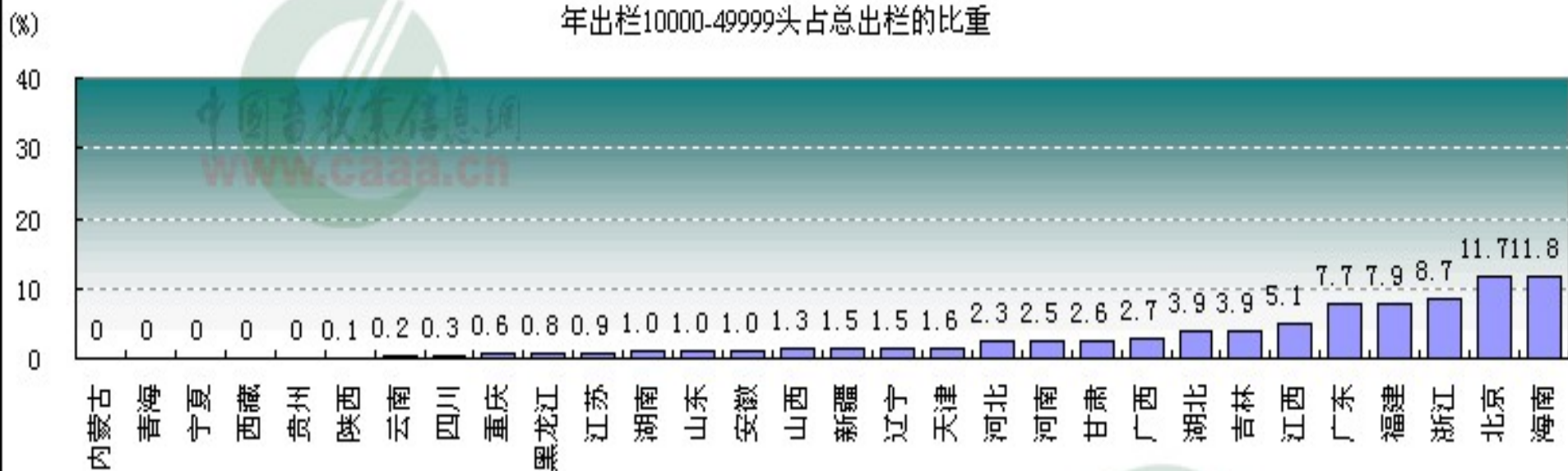
年出栏500-2999头占总出栏的比重



年出栏3000-9999头占总出栏的比重



年出栏10000-49999头占总出栏的比重



年出栏50000头以上占总出栏的比重



# Serious Pollution by Animal Waste

- The rapid growth of large-scale high-density stock and poultry farms has caused apparent problem of environment pollution. Discharge of animal waste is far more than industrial solid waste. It is 5 times the industrial solid waste in provinces of Henan, Hunan, etc. Animal waste treatment rate is low. It has become the major pollutant to natural environment.
- A poultry farm with 10 thousand fowls produces 680 tons of animal waste annually. A pig farm with 1 thousand pigs produces 3000 tons of animal waste annually.

# Composting Yard at Xingda Pig Farm of Hebei Province



25.10.2006

# Dung Pool for a Farm with 10-thousand Live Pigs in Stock





Huimin is one of the numerous pig-raising villages in Taihu County of Anhui Province. Every household raises pigs from dozens to hundreds. An association for pig-raising has been established in the town. Huimin was once considered an example for others to follow all over the province. But they have been unable to treat pig wastes over the years. And it is this factor that causes serious environmental crisis and put restriction on sustainable development of this area.

# Pollution by pig wastes here and there in Huimin Village





# Pond polluted by pig wastes in Huimin Village



# Hideous pollution by pig-raising industry



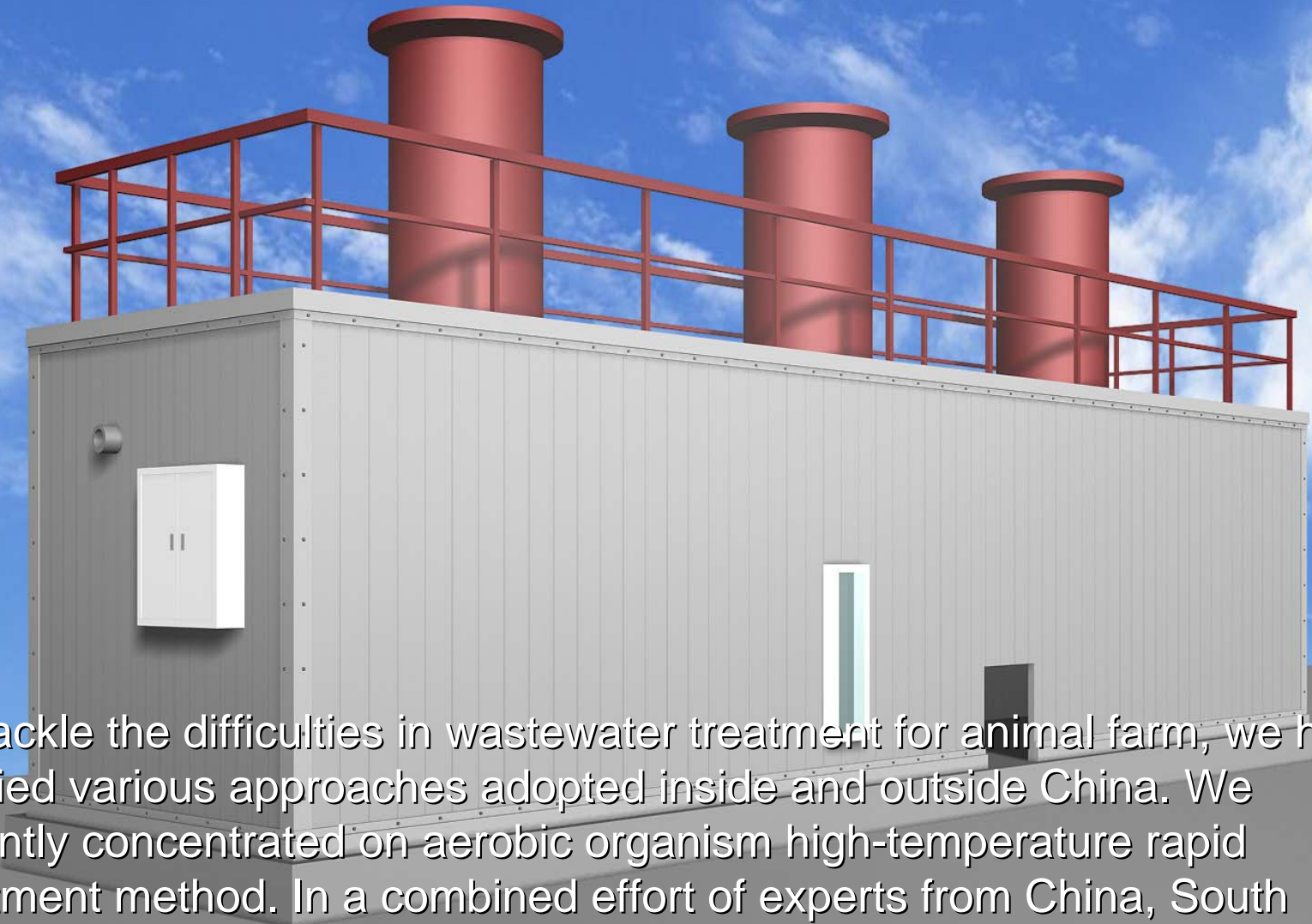
Massive discharge of wastewater from pig farms has serious consequence.

- Huimin buys in feed and sells out live pigs. What remains is huge pollution. Living environment has become intolerable for the villagers.
- Money earned from pig-raising can not make up for the loss in environment pollution.
- There is pervading foul smell everywhere. The villagers' living condition is degraded.
- Pathogens and pests are threatening the health of human being and domestic animals.

# Difficulties for Wastewater Treatment in Stock and Poultry Farms

- Stock and poultry farms have massive discharge of wastewater. (Water-consuming is a universal occurrence for pig-raising all over China. A pig will consume 8-10kg of water a day in average.) The wastewater is low temperature.
- The wastewater is a mixture of liquids and solids of many components. It is thick and highly organic, and has high content of COD and BOD.
- Since stock and poultry farms do not have high profit, very little investment can be made for wastewater treatment.
- Stock and poultry farms are becoming the largest pollutant source for rural waters. In 3-5 year's time, animal waste pollution will beat the pollution by fertilizer, industrial wastewater, and domestic wastewater, and become the "Champion" pollutant for agricultural environment.

# 全自动粪水处理机外观图



- To tackle the difficulties in wastewater treatment for animal farm, we have studied various approaches adopted inside and outside China. We recently concentrated on aerobic organism high-temperature rapid treatment method. In a combined effort of experts from China, South Korea, and Japan, a type of integrated equipment suitable for treatment of China's stock and poultry waste water has been worked out.

Treatment is carried out once and for all within 24 hours. There is NO waste discharge.

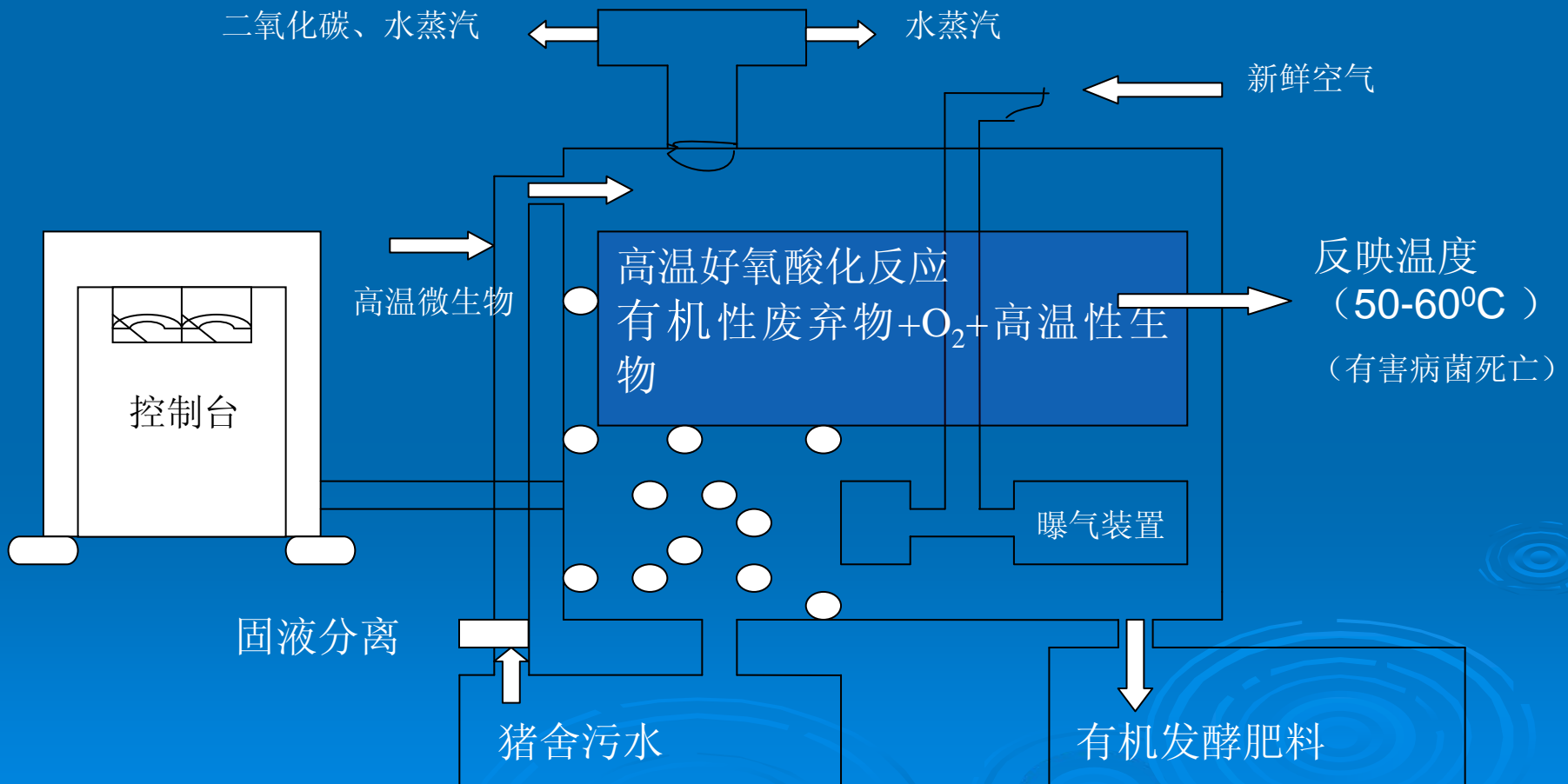
**Sanitization:** Under aerobic condition, photosynthetic microorganisms will kill harmful bacteria by heating and fermenting.

**Concentration:** 40% concentrated

**Resource:** High-efficiency organic fertilizers are produced. 100% reuse rate



# Sketch to Demonstrate Animal Wastewater Treatment System



# Huimin Village Pig-Farm Wastewater Treatment as Pilot Demonstration

- A bio-treatment system is established at a larger-scale pig farm for an area where there are a lot of small-scale pig farms. The owner of the larger-scale pig farm will be responsible for management of the system. The system will collect and treat animal wastewater from the nearby farms.
- The project is funded by enterprise investment, government fund, and social sponsor.
- The pollution discharge fee / penalty paid by the farmers, together with the profit from sales of organic fertilizer will be able to fund for normal operation of the system.
- Both the village environment and the villagers' health conditions are on the improve. Green organic agro products are promoted.



# China government has strengthened rural environment protection measures.

- Laws and regulations for livestock industry are being established and perfected. In 2001, China National Environment Protection Administration issued “Regulations for Control of Livestock Industry Pollution”, “Standard for Livestock Industry Dischargeable Pollutants”, and “Technical Codes for Livestock Industry Pollution Prevention & Control”. In July 2006, “Animal Husbandry Law of People's Republic of China” went into effect. These laws and regulations have detailed stipulations for animal farms, from proper locating, to overall layout, dung cleaning technique, dung storage, wastewater treatment, treatment & utilization of solid dung, feed & feeding management, sick & dead animals disposal, pollutant monitoring, etc.
- It is forbidden to build any pig farms without wastewater treatment facility.



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